FACTORS AFFECTING THE ADOPTION OF INTERNET BANKING IN THE KINGDOM OF BAHRAIN

Overcoming Barriers to Adoption Through the Use of Biometrics

YUSUF MOHAMED ABDULLA MOHAMED JANAHI

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Abstract

The emergence of the Internet in business as a marketing tool and as a communication medium is one of the existing challenges for the banking industry. Because of this evolution, the banking industry has adopted Internet banking both for financial transactions and for the provision of information about products and services. Based on the ideas mentioned, this study aimed to examine the factors which may affect the intention to use Internet banking in the Kingdom of Bahrain with the following research objectives to be achieved: first, to identify the factors which affect the intention to use and adopt Internet banking in the Kingdom of Bahrain; second, to develop a model based on the identified factors that affect the intention to use Internet banking in the Kingdom of Bahrain; and third, to test the reliability and validity of the proposed model and find its implications on the intention to use and adopt Internet banking.

In this study, five variables were initially chosen, namely, perceived privacy protection, perceived security protection, perceived trust, perceived information quality and perceived risks/benefits that may affect the intention to use Internet banking. Besides the five variables, two more variables were included: cultural dimension and biometric technology to measure a significant relationship with any

of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain. As a quantitative method of research, the study focused on assessing the co-variation among naturally occurring variables with the goal of identifying predictive relationships by using correlations or more sophisticated statistical techniques. In analysing the data, the descriptive statistics were used. In addition, construct reliability and discriminant validity tests were conducted and structural equation modelling were used to test the research model and verify the hypotheses.

The cultural context has rarely been commented on in previous research, but as a result of taking this factor into account in addition to the more technical issues, a number of practical implications became evident for banking in Bahrain that may have applicability elsewhere in the Arab world. These include both a focus on relationship management as well as the need for additional levels of security through biometric fingerprinting to be implemented by banks wishing to increase the adoption of Internet banking amongst existing customers. These strategies also have potential to attract new market segments.

KEYWORDS:

Bahrain, Biometric, Security, Authentication, Cultural Dimensions and Internet Banking.

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Y.M.A.M.J.

DEDICATION

I would like to dedicate this book to my father who inspired me to work hard, to take everything seriously and to do my best in every endeavour to achieve my goals.

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1.0 CHAPTER 1

1.1 Introduction

1.2 Background

The emergence of the Internet in business as a marketing tool and as a communication medium is one of the existing challenges for the banking industry. Current academic literature reveals that the Internet is continuing to create business opportunities and an increasing number of organisations are investing in this electronic media to perform their marketing activities. As a result of this widespread use, electronic commerce (e-commerce) has allowed businesses to offer added services and convenience to their customers. Because of this evolution, the banking industry has adopted Internet banking both for financial transactions and for the provision of information about products and services.

The growing utilisation of the Internet and other global online networks has thus created new commercial opportunities and new sets of global and national trading relationships. Likewise, the use of Internet banking has brought many benefits which include: convenience; minimal cost of services; no barrier limitations – faster delivery of information from the customer and service provider; time-saving; low transaction fees and it encourages queue management which is one of the important dimensions of e-banking service quality (Gonzalez et al., 2008; Singhal and Padhmanbhan, 2008).

The rate of technology adoption across countries differs between each other, which could be attributed to the nature of the technology, societal receptiveness, government policy and a number of other social factors (Eseonu and Egbue, 2014). The authors further noted that due to the multi-dimensional nature of technology adoption and innovation, a difference in rates of adoption of technology across countries can be attributed not only to economic and technological factors, but also to socio-cultural factors. Thus, the authors noted that technology adoption may be reflective of cultural differences. Furthermore, culture influences attitudes and behavioural intention towards technology and innovation, which have been shown to affect decisions to adopt technology (Eseonu and Egbue, 2014).

Applied researchers have indicated how culture also plays an important indirect effect or a moderating effect on technology acceptance (Guo et al., 2009; Twati, 2008). These authors argued that cultural differences exist within and across political boundaries which play an important role in the adoption of technology. In line with this idea, Alkhaldi et al. (2011) investigated the impact of national culture by means of video conferencing on knowledge sharing. The authors found that an existing model that captures national cultural impact was lacking. Likewise, their study focused exclusively on general information technology acceptance, without any particular medium other than measuring national culture at a national level. These authors also carried out a review of previous work and examined the cultural and technological acceptance theories before proposing a conceptual model.

With this in mind, the present study will use the Technology Acceptance Model

(TAM), the most popular employed theoretical model for analysing an individual's acceptance of technology (Lai and Li, 2010; Law, 2007; Yi et al., 2006) as the basis of the research model. However, an investigative study suggests that TAM could only be valuable if it is extended to tackle specific issues, such as cultural issues (Khasawneh and Ibrahim, 2008). In line with this idea, this inquiry will also use Hofstede's (1980) cultural dimension as a cultural lens to identify the factors affecting the adoption of Internet banking in the Kingdom of Bahrain.

The need to understand how and why technology has or has not been adopted is important for managers/service providers and customers alike (Thulani, 2009). In relation to this, Mavri and Ioannou (2006) explained that there are crucial factors that affect an individual's decision to use or not to use online services. These include age, the difficulties of using the Internet, the fear of changes in the banking sector due to technological development and the lack of information concerning products and services provided to customers through electronic delivery channels. In addition, factors such as the speed of transactions or the cost of using the Internet have little impact on an individual's final decision (Mavri and Ioannou, 2006).

Although there is a great deal of uncertainty regarding the potential opportunities of this medium, the rapid growth of e-commerce justifies the need for undertaking research in this area. Peterson et al. (2003) pointed out that culture plays a significant role in decision making and the type of technologies used to support decision making. Other studies suggest that culture is one among a number of

national-level factors associated with the rate of IT adoption (Quaddus and Tung, 2002).

For instance, Zakour (2007) explored IT adoption and reported that individualistic users are more concerned about their own opinion. However, the opposite is true for collectivists. High power distance cultures are less accepting of IT than those from low power distance cultures. Zakour concluded that masculine cultures are more established for IT usage, because the use of IT is associated with accomplishing their goals.

However, the need to dig deeper into how culture affects users' perceptions and beliefs after they have adopted an information technology (IT) led to the development of this empirical inquiry. It is, therefore, the aim of this current investigation to utilise a cultural model that focuses on the relationship between users' cultural profiles and post-adoption beliefs in the context of Internet banking.

In Bahrain there is competitive pressure from foreign banks which has forced local banks to reconsider the way they conduct their businesses. This scenario has led banks to focus more on the field of customer retention as it is costly to attract new customers when compared with retaining existing customers (Alqudsi-ghabra et al., 2014). In particular, Internet banking is one way to retain higher profit, giving an edge to banks that offer this service, when compared with those banks that operate exclusively offline. Therefore, it is becoming increasingly important for marketers to better understand which factors encourage consumers to use Internet banking and which could positively enhance their perceptions of the bank.

The results of Sarmad and Awadhi's (2012) study on the different metrics profile of Internet usage in the Kingdom of Bahrain revealed that daily access to the Internet is 90% of total respondents, Internet access from the workplace is 39%, and over 90% of all computer users have used the Internet for more than six years. Nonetheless, the adoption of Internet banking has not yet reached the levels that banks would like to see in Bahrain in comparison to the level of usage in other countries (Alqudsi-ghabra et al., 2014). Bahrain is considered to be one of the states with the highest levels of Internet usage amongst the Gulf Cooperation Council (GCC) and has shown strong ratings in the World Economic Forum's Global Information Technology Report (GITR) 2014. The output of the report shows that Bahrain ranked 29th in the Networked Readiness Index (NRI) supported by affordable ICT access (25th) and uptake by individuals is considered to be one of the best in the world (14th), with a very high number of Internet users.

Interestingly, the findings of Al Soufi et al. (2013), who undertook a study that focuses on exploring the quality of Internet banking services in Bahrain, revealed that more than half of respondents were using Internet banking and most of the Internet banking users were in the 25–34 age group and had university degrees. However, it was also revealed that more than 45% of the non-Internet banking users had the perception that Internet banking was not safe.

It is, therefore, important to examine the factors that affect customers' usage of Internet banking in Bahrain. Within this context, as an information technology (IT) specialist, the researcher became interested in the problem of the uptake of

Internet banking in Bahrain. As an employee in both the retail and investment banking and finance sectors for more than 20 years, the researcher has been responsible for developing IT infrastructure for several banking institutions, playing a key role in implementing core banking systems to facilitate a range of services and products, including: Internet banking; telebanking; automated teller machines (ATMs). These personal experiences are the motivation for understanding the factors that affect the adoption of Internet banking. Thus, this study will focus on the context of the Technology Acceptance Model, on Hofstede's cultural dimensions and biometric technology to increase security measures for Internet banking users.

1.3 Aim and Objectives of the Study

The primary aim of this study is to examine the factors affecting the adoption of Internet banking. Accordingly, this main aim is interpreted into the following research objectives to be achieved: (1) To identify the factors which affect the adoption of Internet banking in the Kingdom of Bahrain; (2) To develop a model based on the identified factors that affect the intention to use Internet banking in the Kingdom of Bahrain; (3) To test the reliability and validity of the proposed model and find its theoretical and managerial implications for Internet banking services.

1.4 Problem Statement

Based on the above-mentioned objectives, this study has produced seven specific research questions:

1. How can the demographic profile and Internet background of the respondents be described?

2. From the perspectives of the respondents, what are the influencing factors that may lead to the intention and use of Internet banking?

3. From the perspectives of the respondents, what are the possible risks and benefits towards the intention and use of Internet banking?

4. What biometric technology may be considered so as to increase the intention to use Internet banking among bank customers?

5. What cultural dimensions may directly affect the intention to use Internet banking in the Kingdom of Bahrain?

6. What conceptual model may be developed which explains the key variables that may affect customers in their intention to use and adopt Internet banking?

7. What are the theoretical and managerial implications that may be derived from the findings of the study?

As a starting point in the investigation into this problem, it was assumed that Bahrain consumers' adoption of Internet banking was likely to be influenced by several factors (Eseonu, Chinweike and OnaEgbue, 2014). Yet, little research has been conducted within a Middle Eastern background where the influence of social networks is an important part of business relationships. This study will also identify the possible technical solutions and offer possible biometric technology that will enhance Internet security among users of Internet banking.

1.5 Significance of the Study

This study is relevant to academics since it has examined the issues related to the adoption of Internet banking and discussed theories which served as bases on the model development and, implicitly, on the hypotheses which were tested in order to validate a model for the acceptance of Internet banking services. This study proposed a new conceptual model that clearly describes the issues associated with Internet banking.

Moreover, the output of the study helped enrich the growing literature in both global and local contexts on the issues of customer retention, especially in the field of Internet banking. The findings are also relevant to bank managers, marketers, software engineers and developers who may be able to understand which factors encourage consumers to use Internet banking.

Furthermore, the present study offers a fresh insight into studying the uptake of Internet adoption in the Bahrain context by adopting Hofstede's cultural dimensions. The theoretical and methodological lenses used in this study could illuminate the complexity of the national cultures of different countries involved in technology adoption. Interestingly, since the present study offers a renewed insight into studying the uptake of the Internet in Bahrain's context by adopting Hofstede's cultural dimensions, a deeper understanding of cultural context may open up new avenues on how Internet banking is accepted or rejected by bank customers in other parts of the world.

Finally, the current study proposed a new conceptual model that clearly describes the issues associated with Internet banking. The results of the study revealed that seven factors, namely, perceived privacy protection, perceived security protection, perceived trust of banking services, perceived information quality, perceived risk and benefits, appropriate biometric technology and the perceptions of cultural dimensions affect the intention to use Internet banking services in the Kingdom of Bahrain. Thus, the model revealed that inclusion of both the cultural dimension and biometric technology as external variables proved its significance in the intention to use online banking in the Kingdom of Bahrain.

1.6 Methodology Used in this Study

This study focuses more on the deductive approach, which starts with a general and ends with a particular, view of the situations. In this study, the application of descriptive research was used in describing the demographic profiles of the respondents. Moreover, the exploratory research was also employed during the first stage of the research in order to obtain the background information about the research problem and to generate hypotheses by carrying out a thorough investigation of the literature.

A quantitative method of research was used in order to assess the co-variation among naturally occurring variables. Moreover, the survey questionnaire was used to collect primary data for the study. A pilot study was conducted using 35 bank customers from a local bank who were not part of the actual survey.

The questionnaire was designed according to the objectives of the survey. In this research the use of the survey questionnaire enabled the researcher to obtain a large amount of data from a fairly sample population in a cost-effective manner. The researcher adopted some items from the questionnaires developed by other authors including Belanger et al. (2002), Kim et al. (2008), Sharma and Singh (2010) and Hofstede (1980), and integrated them into the final questionnaire. Moreover, the theories related to technology adoption served as a guide in adopting parts of the questionnaire that have been already validated.

The reliability of the research instrument was measured using Cronbach's alpha in which the results were compared with the 0.7 level recommended as a cut-off point (Nunnally and Bernstein, 1994). The hypothesised relationships and reliability described in the model were tested using AMOS (Analysis of Moment Structures), an add-on module for SPSS Amos version 18 software for the type of internal consistency and reliability.

In this study, stratified sampling was used in which the researcher divided the entire target population into different sub-groups or strata from which the final subjects were purposely selected. The selected respondents were customers from local, regional and international banks in Bahrain. In this study, 300 questionnaires were used out of 330 distributed to the customers of selected local, regional and international banks operating in the Kingdom of Bahrain which represented a response rate of 90.9%.

The various statistical tools used were frequency, percent, median, standard deviation, skewness, kurtosis and Pearson correlation in analysing the data. Moreover, construct reliability and discriminant validity tests were conducted and structural equation modelling (SEM) was used to test the research model and verify the hypotheses.

1.7 Summary and Organisation of the Study

The study is organised into seven chapters as follows:

Chapter 1 presents the introduction which includes the setting of the study by outlining the research problems and queries. The aims and objectives, significance of the study and the methodology used are described in this section.

Chapter 2 presents the literature review which covers an extensive review of conceptual and empirical literature on topics of interest. The review includes the determinants of user acceptance and resistance of technology. Moreover, this part presents studies related to the area of research in order to establish a clearer picture of the research problems that have been proposed and its relevance to the present setting. Finally, the main purpose of this chapter is to review the current theories in the field of Internet banking.

Chapter 3 discusses the conceptual framework of the study which explains the key variables and the relationships in which seven hypotheses emerged for testing. Five major variables were initially chosen that may affect customers in the adoption of Internet banking, namely, perceived privacy protection, perceived security

protection, perceived trust, perceived information quality and perceived risks/benefits. Two more major variables were included: cultural dimension and biometric technology to measure a significant relationship with any of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain.

Chapter 4 encapsulates the research methodology by describing an overall picture of a quantitative method of research which includes the following topics: Objectives and Research Questions; Research Approach; Methods Used to Collect Data; Research Instruments; Validation of the Research Instrument; Reliability and Validity; Normality of Data; Target Population; Sampling Method; Context; Data Analysis; Descriptive Analysis; Structural Equation Modelling (SEM); Confirmatory Factor Analysis (CFA); Exploratory Factor Analysis (EFA).

Chapter 5 describes the data analysis sourced from the survey questionnaires which are presented, analysed and interpreted in this section. The results of the major findings from a quantitative analysis of the intention to use Internet banking in the Kingdom of Bahrain are presented which include: the Demographic Profile of the Respondents; Background Regarding the Use of the Internet; The Factors That Influence Internet Banking Adoption; Security Concerns About Online Services; Security of Devices Used to Access the Internet; Devices Used to Access the Internet; Devices Used to Access Services on the Internet; Testing the Reliable Model; Exploratory Factor Analysis (EFA); Confirmatory Factor Analysis (CFA); Unidimensionality; Standardised Regression Weight; Root Mean Square Error of Approximation (RMSEA); The Goodness of Fit Index (GFI); Tucker-Lewis Index

(TLI) and the Comparative Fit Index (CFI); Standardised Residual Co-Variance; Modified Confirmatory Model; Convergent Validity; Reliability; Discriminant Validity; Path Analysis. Moreover, this chapter presents the overview of the research objectives together with the results and findings. This chapter assesses whether the hypotheses developed for the research are supported from the findings or not. Thus, each section individually addresses the research questions and verifies the hypotheses using the findings discussed in the previous chapter.

Chapter 6 – summary and conclusions of the study.

2.0 CHAPTER 2

2.1 Literature Review

The growing utilisation of the Internet and other global online networks has created new commercial opportunities and new sets of global and national trading relationships. With the use of the Internet, Internet banking has brought about many benefits such as convenience, minimal cost of services, no barrier limitations, and a host of others to name a few. Moreover, other benefits are the retention of higher profit, which gives an edge to banks that offer this service, when compared with those banks that operate exclusively offline. Therefore, it is becoming increasingly important for marketers and researchers to better understand which factors encourage consumers to use Internet banking that could positively enhance their perceptions of the banks' online services. While Internet banking services may be accessed from the comfort of one's home or through mobile phones, there are possible drawbacks such as reduced face-to-face interactions and security risks. The review will concentrate on the determinants of user acceptance and resistance of technology as these concepts have been addressed theoretically and empirically in the scientific literature. Moreover, this part presents studies related to the area of research in order to establish a clearer picture of the research problems that have been proposed and its relevance to the present setting. Finally, the main purpose of this chapter is to review the current theories in the field of Internet banking. Among the different models discussed here are the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989), adapted from the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975), and Theory of

Planned Behaviour (TPB) (Ajzen, 1985). These theories were selected out of the most frequently used ones in information technology acceptance determination in banking activities. From among these theories, the TAM served as the basis of the model development and, implicitly, of the hypotheses to be tested in order to validate a model for the acceptance of Internet banking services. The reason for this is that the TAM has a greater flexibility to be extended and applied to many different information systems.

2.2 Background

This chapter presents the literature relevant to the current study and identifies the major subject areas related to the study of research and proposes a way to investigate the research problem and demonstrates its relevance. Section 2.3 of this chapter provides an overview of the Internet banking concept and definitions. Moreover, it also discusses how previous researches have established factors known to have an impact on the uptake of Internet banking services in other parts of the world. This is followed by Section 2.4 which deals with users' acceptance of technology. Section 2.5 discusses the technology acceptance theories related to customers' adoption of Internet banking with the following sub-sections: 2.5.1 discusses the Theory of Reasoned Action (TRA); Section 2.5.2 explains the Theory of Planned Behaviour (TPB), while Section 2.5.3 expounds the Technology Acceptance Model by Davis (1989). Furthermore, Section 2.6 deals with the related factors influencing consumers' adoption of Internet banking; Section 2.6.1 discusses security and Section 2.6.2 explains privacy issues. Regarding Internet banking, Section 2.6.3 deals with customers' trust in Internet banking transactions

and Section 2.6.4 discusses information quality. In addition, Section 2.7 discusses the cultural impact on technology adoption. Section 2.8 explains the application of biometric technology. In conclusion, Section 2.9 presents the problem statements and gaps from this overview of recent research, where certain factors emerged as determinants or barriers to the adoption of Internet banking.

2.3 Internet Banking Concepts and Definition

Rampur (2011) discussed the benefits of Internet banking as widely used by the masses. According to Rampur, Internet banking enables people to carry out most of their banking transactions using a secure website, which is operated by their respective banks. With its varied characteristics and functions, customers can obtain an account summary, balance inquiry, check their mini statement (last five transactions), check their current month's statement, and check previous months' statements among others via the Internet. In addition, customers can also transfer their funds in real time between personal accounts and to other external bank accounts. The aforementioned services are conducted through Internet banking in a secure manner.

According to Hinson et al. (2011, p.278) banking is becoming increasingly competitive and "*several banks have to carefully rebuild their reputation after the global economic crisis*". Because of this situation, banks are reconsidering the way they conduct their business in order to retain existing customers as well as attracting new market segments. This has led to an increased interest in Internet banking as one strategy towards this goal. Internet banking is thought by some to

increase ‘stickiness’ and, according to Johnson (2007), banks are retaining higher profit customers through offering a mix of products and services that better meet their needs than other banks that are still using traditional delivery of banking services.

As a result of the Internet, banks can now offer added service and convenience to their customers: early banking websites were informational, but with the advent of secured *“transaction technologies, more banks are now using Internet banking both as a transaction as well as informational medium*” (Chong et al., 2010, p.269). Banks must therefore gain a better appreciation of which factors encourage consumers to use online services, and which positively affect their perceptions of the bank (ibid.). According to Zhao et al. (2010, p.8), this focus has also come about because “*customer adoption of Internet banking has not yet progressed to the stage which most banks would like to see”* (ibid.).

In many countries there is an untapped market of bank customers of what Lee, Kwon and Schumann (2005) term as “*prospective adopters*”. University students fall into this category and, as such, they have been the subject of many studies because they are likely to obtain professional jobs after graduation. These prospective adopters will become profitable customers of the banks in the long term but this group, however, is famous for their tendency towards multiple banking and high bank switching rate (Narteh et al., 2011:393). For these reasons, banks need to investigate fully what aspect of products and quality services need to be offered, including Internet banking, in order to capture and retain this market segment (2006, p.50). Clearly, in order to grow consumer Internet banking

demand, banks must make key improvements that address consumer concerns. Thus, it would be appropriate for banks to gain an understanding of the key factors that influence customers' Internet banking adoption in which 'prospective adopters' like university students were included.

According to the Internet User Penetration Survey (Economic Development Board, 2011), Bahrain has one of the highest levels of Internet usage amongst the Gulf Cooperation Council (GCC) countries, yet even the locals are reluctant to avail themselves of online banking services. Table 2.1 presents the Internet usage in the GCC.

Table 2.1 Internet Usage in the GCC

Middle East	Population	Internet Usage, 2011	% Population (Penetration)
Bahrain	1,214,705	649,300	53.50%
Kuwait	2,595,628	1,100,000	42.40%
Oman	3,027,959	1,465,000	48.40%
Qatar	848,016	563,800	66.50%
Saudi Arabia	26,131,703	11,400,000	43.60%
United Arab Emirates	5,148,664	3,555,100	69.00%

Source: EDB, 2011

The outcome of the survey, conducted in March 2011, showed Bahrain was placed

third after Qatar and the United Arab Emirates (UAE), as illustrated in Table 2.1. It is therefore important to examine what affects customers' usage of Internet banking in Bahrain (EDB, 2011).

To support this claim, the data from the 13th edition of The Global Information Technology Report (2014) shows that Bahrain is one of the countries which has been singled out by the World Economic Forum for their ability to use information and communication technology (ICT). In the same manner, Bahrain has shown strong ratings in the World Economic Forum's Global Information Technology Report (GITR) 2014. According to the report, Bahrain ranked 29th in the Networked Readiness Index (NRI), supported by affordable ICT access (25th). The report shows uptake by individuals is considered as one of the best in the world (14th), with a very high number of Internet users (The Global Information Technology Report, 2014).

While it was reported that Bahrain's Internet uptake is considered to be one of the best in the world, Al Soufi et al. (2013) undertook a study that focused on exploring the quality of Internet banking services in Bahrain in order to give recommendations towards enhancing current Internet banking quality and delivery. Part of the survey covered the demographic details, customers' Internet banking behaviour and Internet banking perceptions. The authors selected five dimensions of Internet banking: service quality, which includes usefulness, personalisation, efficiency, cost, safety and privacy to identify the perceptions of customers about Internet banking in Bahrain. The findings revealed that more than half of respondents were using Internet banking and most of the Internet banking users

were in the 25–34 age group and had university degrees. However, it was also revealed that more than 45% of the non-Internet banking users had the perception that Internet banking was not safe. In addition, another reason for not using these services was that Internet banking websites were notably lacking in the area of customer understanding and did not provide options for customers to customise their preferences, quick links and login landing options. The study would have been more relevant if the researchers included other factors such as cultural dimensions that may affect the perceptions of customers about Internet banking adoption since Bahrain has unique cultural characteristics.

Savolainen (2007) applied the approaches on the cultural differences of nations. In his findings, Savolainen concluded that national culture impacts organisations in relation to how activities and procedures are undertaken by people in organisations. Likewise, values and social structure, which emanate from national culture, are influencing factors on organisations' activities and procedures. By and large, the study revealed that the local people who create their philosophy of life represent national culture; thus, the reasons why some activities are carried out differently are culturally dependent and specific to the country concerned.

At this juncture, Bahrain's self-identity as part of the Arab world and religious affiliation is of primary importance in defining one's identity. Expatriates constitute 20% of the population who come mainly from other Arab nations but also from India, Pakistan, Southeast Asia, Europe and America. While relations are not unfriendly, foreigners generally are not integrated into Bahraini society. The vast majority are temporary workers and thus constitute a transient population.

In the Islamic tradition, women have a lower status than men and are considered weaker and in need of protection. Bahrain has been more progressive than other Arab nations in its treatment of women. Seventy percent of the population is Shi'a Muslim, 15% is Sunni Muslim, and the remaining 15% is Christian or Jewish, or follows indigenous practices. Muslims believe in the equality of all people before Allah. There are several differences between the Sunni and Shi'a sects of Islam. While most Muslims in the world are Sunni, in Bahrain, the majority are Shi'ite (everyculture.com, 2016). As argued by Hofstede (1980; 2001), culture stays stable over time and merely changes slowly. Obviously, the reviewed literature points out that there is an influence of a powerful culture in technology adoption, so that the current investigation intends to fill in the gap identified by exploring the role of national culture as one of the factors that is likely to influence the acceptance or resistance of electronic banking services in the Kingdom of Bahrain.

2.4 Users' Acceptance of Technology

In order to predict, explain and increase users' acceptance, there is a need to better understand why people accept or reject information technology (Davis et al., 1986). This situation led researchers to develop and apply various models to understand technology acceptance among users. Among the different models proposed are the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989), adapted from the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975), and Theory of Planned Behaviour (TPB). User acceptance of technology has been an important field of study for over two decades now (Chuttur, 2009). Thus, it is important to understand the reasons why

bank customers are reluctant to accept the online banking system which becomes a significant issue for the banking industry. A better understanding of this issue will help alter the nature of the system and the process by which it is implemented. By doing so, banks can ultimately influence users' acceptance in a positive way. Furthermore, the more users use online banking systems, the more they will contribute in improving banks' performance. The next section will discuss in detail the theories related to users' acceptance of Internet banking.

2.5 Technology Acceptance Theories Related to Customers' Adoption of Internet Banking

The following theories suggest potential influences on customers' acceptance of Internet banking. These theories are not considered to be exhaustive as there are many other models and theories, nevertheless, they were selected out of the most frequently used ones in information technology acceptance determination in banking activities. These theories served as bases on the model development and, implicitly, on the hypotheses to be tested in order to validate a model for the acceptance of Internet banking services. Among the various user acceptance theories are the Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM), which are considered to be the most widely accepted, and used by the IT researchers. It is important to note that due to the diversity and complexity of factors that act on taking the decision to adopt online banking transactions, it is important to discuss the aforementioned theories. Besides, these theories were discussed since it was assumed that Bahrain consumers' adoption of Internet banking was likely to be influenced by

some cultural factors, attitudes, behaviour and beliefs, for instance, social networks, which play an important part in conducting business.

2.5.1 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) introduced by Fishbein and Ajzen (1975) has been widely used to explain an individual's behaviour. The TRA hypothesises that behaviour is predicted by an individual's intention to engage in a given behaviour. There are two factors that predict intention, first is the individual's attitude towards the outcome of the behaviour and, second, the subjective norm which refers to the opinions of the person's social environment.

The attitude toward behaviour is a product of beliefs about the behaviour and the individual's evaluation of the outcome resulting from that behaviour. The theory postulates that the intention to perform a behaviour will be higher when the individual has positive evaluation of performing the behaviour (Ajzen, 1991).

On the other hand, subjective norm refers to an individual's perceived social pressure to perform or not to perform target behaviour. The theory suggests that people often act based on their perception of what others think they should do, and their intention to adopt behaviour is potentially influenced by people close to them. The subjective norm is a composite of normative beliefs about a certain behaviour and the individual's motivation to comply with relevant others (Fishbein and Ajzen, 1975). Normative beliefs indicate one's perception of the influence of opinion among reference groups while motivation to comply indicates the extent the individual wants to comply with the wishes of the relevant of (Mathieson, 1991).

The Theory of Reasoned Action (TRA) has been widely applied in a variety of research settings, from predicting knowledge sharing intentions (Bock et al., 2005) and in the information system field (Loiacono et al., 2007; Rensel et al., 2006; Shih and Fang, 2006). For example, the study of Shih and Fang (2006) used TRA to determine whether attitude and subjective norms would influence an individual's intention to adopt Internet banking. Their study revealed that consumer attitude and specific network attributes had a significant relationship with behavioural intention, while subjective norms did not.

To empirically test a research model based on the Theory of Reasoned Action, Md nor *et al. (2008)* have undertaken a study using Internet banking as the target technology. The results of the investigation have supported the theory's proposition that individuals' behavioural intention to use Internet banking is influenced by their attitude and subjective norm. Furthermore, the findings indicate the applicability and ability of the Theory of Reasoned Action to predict adoption intentions. Moreover, the study found that friends, family and peers have a positive influence on individuals to accept the technology. However, one identified limitation of the study was the use of student subjects. Although students are good surrogates for banking customers because they typically are current banking customers, questions remain concerning the generalisability of the results to a larger population.

However, there were several observed limitations of TRA when it was applied in particular contextual settings (Davis et al., 1989; Ajzen, 1991). According to Davis et al. (1989), TRA is a general behavioural theory and it does not point out what

particular beliefs would be appropriate in particular situations. Likewise, Ajzen (1985) pointed out that the TRA theory was not suitable to predict situations where individuals have low levels of volitional control. In order to address these limitations, a new theory was proposed called Theory of Planned Behaviour (TPB) which is discussed in the next section. Figure 2.1 presents the Theory of Reasoned Action (TRA).

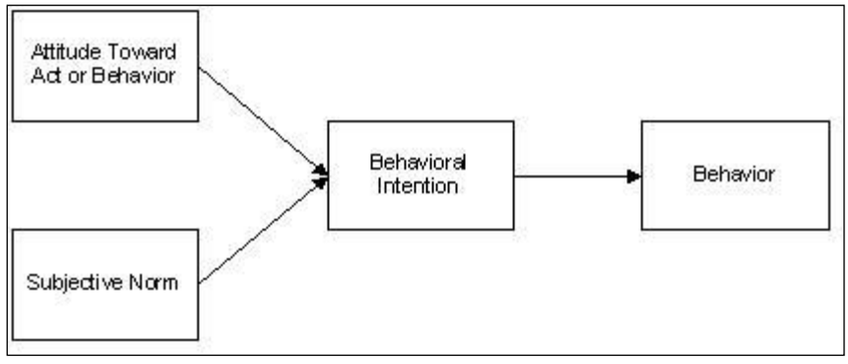

Figure 2.1 Theory of Reasoned Action (TRA)

2.5.2 The Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) suggests that attitude, social influence factor or subjective norms (SN) and perceived behavioural control (PBC) jointly determine the intended and actual behaviour (Ajzen, 1991). This theory suggests that a central factor in human behaviour is behavioural intention, which is affected by attitude toward behaviour, subjective norm and perceived behavioural control (Ajzen, 1985; 1991; 2002). Subjective norm (SN) expresses the perceived organisational or social pressure of a person who intends to perform the behaviour in question. In other words, the subjective norm is relative to normative beliefs about the expectations of other people. On the other hand, perceived behavioural control (PBC) reflects a person's perception of the ease or difficulty of implementing the behaviour in question. It concerns beliefs about the presence of control factors

that may facilitate or hinder their performing the behaviour. The PBC was therefore seen as an ease or difficulty in performing a particular behaviour (Ajzen, 1991). The overall aim of the TPB is to attempt to predict deliberative and planned behaviour. The theory includes the construct perceived behavioural control as an addition to the TRA to take into account the more common situation in which individuals do not have complete voluntary control over their behaviour, such as when they lack skills or resources to perform a particular task (Armitage and Christian, 2003; Ajzen, 1991).

In summary, TPB posits that behavioural intention is a function of an individual's beliefs in three areas: behavioural beliefs (attitude toward behaviour) – meaning their beliefs about the probable outcome of the behaviour; normative beliefs (subjective norm) which refers to individuals' beliefs about the normative expectations of significant others; and control beliefs (perceived behavioural control) which means the beliefs regarding absence or presence of factors that might facilitate or impede the performance of the behaviour (Ajzen 1991).

Numerous studies demonstrated the applicability of TPB to various content domains and its ability to provide a very useful theoretical framework for understanding and predicting the acceptance of new information technology (Chau et al., 2002; Liao et al., 1999; Venkatesh et al., 2000; Taylor and Todd, 1995; Bhattacherjee, 2000). These studies suggest that TPB effectively explains individual intentions and behaviour in adopting new information technologies for instance, the acceptance of telemedicine technology by physicians (Chau et al., 2002), the widespread adoption of virtual banking (Liao et al., 1999), computer

resource centre adoption and usage (Taylor and Todd, 1995), adoption in work settings (Venkatesh et al., 2000), acceptance of electronic brokerage services (Bhattacherjee, 2000) and others. Although previous information system research studies suggested that perceived behavioural control may be an important predictor of intentions to use and actual usage (Mathieson, 1991; Taylor and Todd, 1995), there is, however, an empirical evidence which suggests that with the behavioural control construct the role of self-efficacy is not only an important incorporation to the theory but it commonly emerges as the most significant factor influencing both behavioural intention to use and actual behaviour (Armitage and Conner, 2001). Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave (Bandura, 1994).

The Theory of Planned Behaviour has also been the target of much criticism and debate. Some researchers reject it outright as an adequate explanation of human social behaviour, for instance Wegner (2002), and Wegner and Wheatley (1999) tend to deny the importance of consciousness as a causal agent and view much human social behaviour as driven by implicit attitudes which refer to positive and negative evaluations that occur outside of an individual's conscious awareness and control. Figure 2.2 presents the Theory of Planned Behaviour.

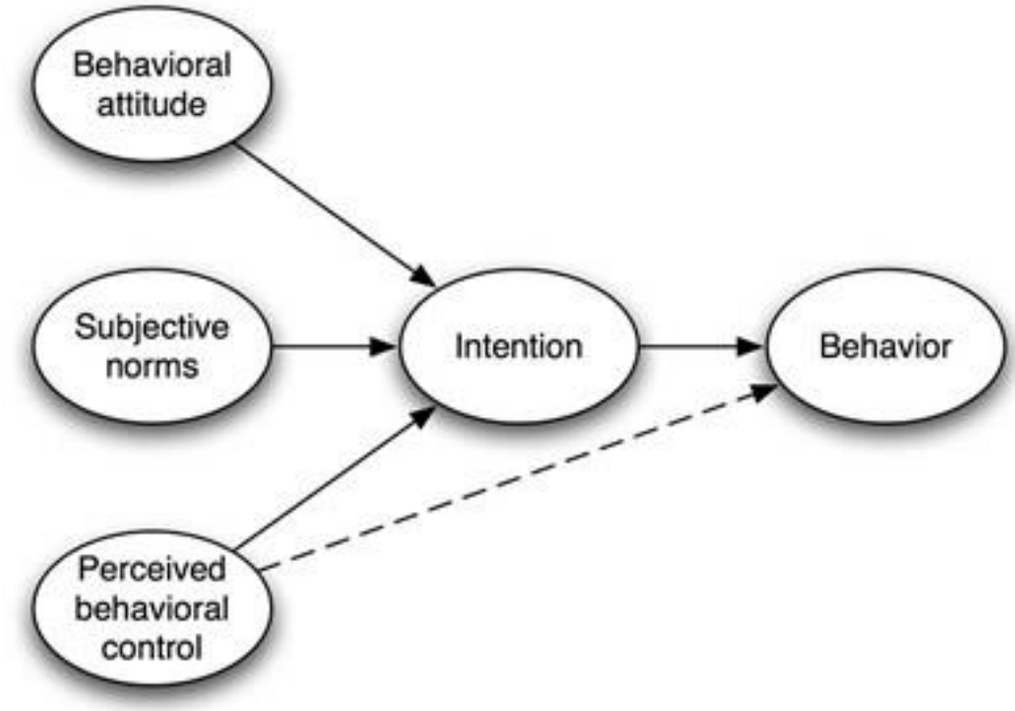

Figure 2.2 The Theory of Planned Behaviour

2.5.3 Technology Acceptance Model by Davis (1989)

The Technology Acceptance Model (TAM) explains the determinants of user acceptance of a wide range of end-user computing technologies (Davis, 1989). TAM is an information system theory adapted from the Theory of Reasoned Action (TRA). The primary purpose of TAM is to predict information technology acceptance and diagnose design problems before users actually use the new system. According to Davis (1989), perceived ease of use is “the degree to which a person believes that using a particular system would be free from effort”, on the other hand, perceived usefulness is “the degree to which a person believes that using a particular system would enhance his or her job performance”. Perceived ease of use also affects the perceived usefulness; the intention to use affects real usage behaviour. Figure 2.3 presents the Technology Acceptance Model.

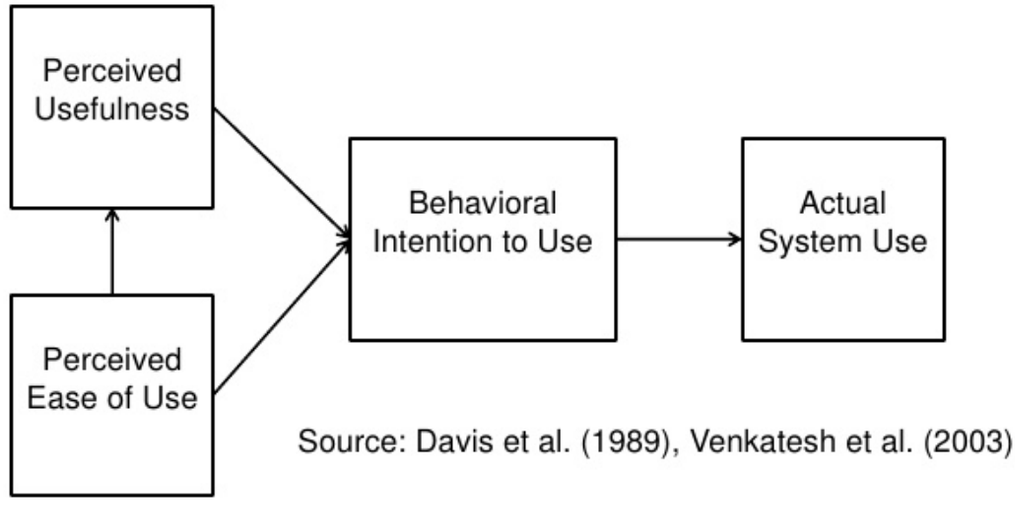

Figure 2.3 The Technology Acceptance Model (TAM)

TAM was originally developed for studying technology at work, which later has been used as such, or modified in order to study users' acceptance of consumer services such as Internet services or e-commerce (Kaasinen, 2005). The Technology Acceptance Model constitutes a solid framework for identifying issues that may affect user acceptance of technical solutions. The modification of the TAM was made by Davis and Venketesh (1996) by removing the attitude variable as they felt that attitude played a minor role in system usage behaviour which was proved while doing a study. It was also analysed that external variables could possibly contain factors like system characteristics, user training, user participation in design and nature of the implementation process.

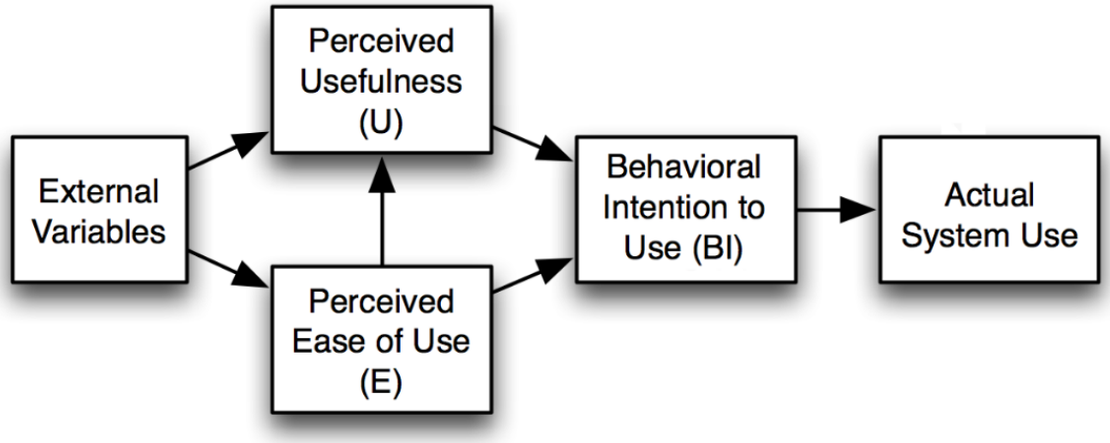

Figure 2.4 Modified TAM by Davis and Venketesh (1996) with External Variables

According to Davis et al. (1989) the two base elements of perceived ease of use and perceived usefulness are the components of these users' beliefs. However, there are some external variables that may affect these beliefs like personal experiences, professional experiences, organisational factors, social and political influences as well as the perceptions of the tasks to be performed using the technology. As Davis and Venkatesh (2004) have proven, the model can be enhanced from the original purpose of studying users' acceptance of existing products to study planned product concepts, e.g. in the form of mock-ups. This indicates that TAM could also be used in connection with technology development projects and processes to assess the usefulness of proposed solutions.

However, there are some inherent limitations of TAM as pointed out by researchers (Wu, 2009; Turner et al., 2010; Wu and Wang, 2005). For instance, Wu (2009)

highlighted that the popularity of TAM may result from its simplicity and its efficiency in providing an initial road map for planning empirical IS research. However, those who adopt the said model may not be able to fully explore and explain the social-technical, cultural and organisational dimensions embedded in the IS usage and operation environment (Wu, 2009). As a result, the original TAM is rarely used by researchers as it is (Turner et al., 2010).

According to Priyanka et al. (2013), although TAM remains the most popular model in analysing information system acceptance, widespread criticism has been directed to it which has led to many changes to the original model. Included in its criticisms is the fact that many researchers feel that TAM is merely theory with questionable heuristic value and limited explanatory and predictive power, triviality and lack of any practical value. Three areas related to its criticism are: (1) The method that is being used to test the reliability of TAM; (2) The variables and relationships that exist; (3) Theoretical foundation. Furthermore, previous studies on TAM have been done with self-reported use data which most researchers feel are subjective in nature. While there have also been few criticisms about the validity of the model, the TAM has overwhelmingly been used worldwide in understanding information systems. Nowadays, researchers need to establish their own research framework by using the original TAM as the core and extending it with new proposed elements and relations in order to satisfy the needs and contexts of specific studies (Wu and Wang, 2005).

In response to this research challenge, this study aims to determine the factors which affect the adoption of Internet banking in the Kingdom of Bahrain since it was

assumed that Bahrain consumers' adoption of Internet banking is likely to be influenced by several factors. For these reasons, the TAM has been chosen as the basis for this research since it has a great flexibility to be extended and applied to many different information systems.

2.5.4 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) introduced and formulated a unified theory, called the Unified Theory of Acceptance and Use of Technology (UTAUT). The theory provides a useful tool for managers needing to assess the likelihood of success for new technology introductions and helps them understand the drivers of acceptance in order to proactively design interventions.

This theory tries to explain the degree of acceptance of the use of information technology and the user's ability to deal with it. UTAUT has been used and applied to answer one of the most critical questions: What are the users' attitudes towards accepting an ICT solution (AlQudah, 2015). The theory consists of four main concepts: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC), which are considered as independent variables that influence dependent variables, behaviourals and usage. Gender, age, experience and volunteers of system use have indirectly influenced the dependent variables via the four main concepts. Behavioural intention is seen as a critical predictor of technology use (Venkatesh et al., 2003).

2.6 Related Factors Influencing Consumers' Adoption of Internet Banking

In order to grow consumer Internet banking demand, banks must identify, manage and address the factors affecting the consumers' intention to adopt and continue usage of Internet banking. Thus, it is crucial for banking institutions to gain understanding of the key factors that influence consumer Internet banking adoption. This study, therefore, investigates the critical elements that shape the consumer decision to adopt Internet banking. Among these are concerns about security, privacy, trust, risk/benefit and information quality, to name a few. This section will discuss these factors in more detailed manner.

2.6.1 Security

Security is a major concern that contributes to an individual's desire to adopt online services. Perceived security is an important factor that influences individuals' Internet banking adoption. Due to security issues ranging from privacy disclosure to financial loss, individuals' willingness to apply for online services may be lessened (Chorng-Shyong Ong, 2015).

Zhao et al. (2010:8) argued that security of banking transactions, as well as the confidentiality of personal account data, are major issues for businesses, public bodies and consumers. Most banks recognise that information and systems supporting the information, are important assets for establishing and leveraging information-based resources and competence, especially for Internet banking in order to improve a bank's competitive edge within the sector (Chang and Ho, 2006, p.345).

In the Estonian study referred to earlier in this chapter, a questionnaire distributed to 1,831 Internet banking users indicated that people's perceptions that "banks keep customer data securely" and that the bank they were using was "safe", contributed to their perceptions of danger to their perceptions of risk (Eriksson, Kerem and Nilsson, 2008). Perceived risk was considered to reflect respondents' apprehension about the trustworthiness of the bank and the Internet channel. This study demonstrated that concerns about Internet banking security had a weak, but nonetheless significant, negative effect on people's adoption decisions, compared to the influence of a range of other factors, such as benefits and usability. There were few differences associated with age, educational background and income level of respondents in this subject as most respondents were from the university.

In contrast, in an earlier study within the Chinese context about Internet banking adopters, Zhao et al. (2010) found that there was a significant relationship between trust and perceived risk. According to the authors, both trust and perceived risk are important in explaining Internet banking adoption. Moreover, perceived risk was evaluated on a multi-dimensional scale that included security, as well as performance, privacy and finance businesses. The results of the study revealed that serious concerns about hacking, computer viruses and the risks of logging onto a fake website were identified (Zhao et al., p.18, 2010). The student respondents, specifically the females, were concerned that a lack of security could lead to the loss of their money and they were also worried that if this occurred, there would be little legal redress. This lack of security not only posed the issue of government regulations and monitoring of the banking system but also the need to

look into the gender differences to be considered by banks when formulating strategies so as to increase trust in Internet banking.

Interestingly, Eriksson et al. (2008:165) indicated that whilst perceived risk is a significant factor in the adoption decision, once customers start using the service, the importance of this component is “rendered insignificant”. According to Gorman (2007:563) there is an international interest in security because it affects not just the individual, but government, software companies, telecoms, banks and any computerised system. The author further argues that the responsibility for Internet security lies not only at the individual level, but also at the level of government, software manufacturing, the commercial sector and international organisations: “*Internet security is a global issue requiring coordinated, global actions to improve security at all levels*”.

2.6.2 Privacy

The growth of the Internet has increased concerns over privacy because of the perceived increase in vulnerability of information (Pope and Lowen, 2009, p.303). Studies have found that the single greatest factor influencing online purchase behaviour is a concern over control of private information, and it can be assumed that conducting banking transactions online will raise similar questions about privacy risk (Pope and Lowen, 2009:303). It was argued by Lee et al. (2011:203) that secrecy can be conceived as a sub-set of security, but in many models such as the extended TAM established to ascertain the barriers to the uptake of innovative technologies such as Internet banking. Bank secrecy is one of the conditions of the relationship between a bank and its customers wherein the

customers' dealings and financial affairs will be treated as confidential. However, this rule does not apply to the customers' credit information which is shared rather freely among lending institutions. The Bank Secrecy Act (BSA) was enacted in the US to keep information about the clients' bank relationships and financial transactions secret (Horn and Kellye, 2006). The record keeping and reporting requirements of the BSA have spawned a vast regulatory and law enforcement network with unprecedented access to private financial information. All "financial institutions" are required to maintain records of certain types of financial transactions and to file detailed reports describing activity judged to be "suspicious". The data in these reports are accessible electronically, without notice, warrant, or probable cause by every US Attorneys' Office and some 60 law enforcement agencies including the FBI, Secret Service and the Customs Service (Horn and Kellye, 2006).

With the use of the Internet, consumers show great concerns on how personal information is so easily collected, stored, processed and utilised. Users of ubiquitous computing have sometimes realised they are actually customers of firms that collect personal information for dubious purposes which has led consumers to become deeply interested in the topic of information privacy (Pavlou, 2011).

In banking, confidentiality expectations are that banks must not provide personal and account information about their customers to others, including sanctions, unless certain conditions apply (for example, a criminal complaint has been filed). With the tremendous development in the field of information, technology and rapid access to electronic data, it is possible for banks to execute increasingly

sophisticated analyses of their customers' saving and spending habits, which enable banks to market their own products more effectively, but also provide a potentially very valuable source of marketing information for third parties, such as Credit Reference Agencies (Abdulah, 2013). Consequently, consumer protection has become a central concern especially with regard to privacy and the capacity of the banks to employ protection systems which are efficient in safeguarding customers' confidential data.

The customer's communications to his bank, like the client's communications to his attorney and the patient's communications to his doctor, have often been characterised as "confidential". They are not legally privileged or immune from production upon showing of probable cause, but the customer does expect his bank to honour in good faith the trust which their relationship entails by not disclosing information in its possession concerning his financial affairs.

The Federal Deposit Insurance Corporation of the US imparts that the privacy rule governs when and how banks may share non-public personal information about consumers with non-affiliated third parties. The rule embodies two principles: notice and opt out.

In summary, all banks must develop initial and annual privacy notices that must describe in general terms the bank's information-sharing practices. Banks that share non-public personal information about consumers with non-affiliated third parties (outside of opt-out exceptions delineated in the privacy rule) must also

provide consumers with an opt-out notice in a reasonable period of time (FDIC, 2016).

In some instances, additional privacy is offered to prevent customers' details being disclosed, which ultimately provides customers with confidence in their bank. The integrity of an information system refers to the impossibility of the transmitted or stored data being modified by third parties without permission. Confidentiality involves the data being seen only by authorised individuals. Authentication allows a certain operation to be executed only after identification, or if there are guarantees of the identity of the party one is dealing with (e.g. a website) (Cristobal et al., 2007, p.331).

Omariba (2012) pointed out that from a privacy standpoint, trust can be viewed as the customer's expectation that an online business will treat the customer's information fairly. Internet privacy refers to the ability of the individual to control information about one's self. This idea was supported by Mukherjee and Nath (2007:1194), who argued that privacy is the most important determinant of consumer confidence. Invasions of privacy occur when individuals cannot maintain a substantial degree of control over their personal information and its use. Thus, any feelings of trust created or developed in the customer's view of the business can ease privacy concerns, which in turn will promote the sharing of personal information, and facilitate the completion of a transaction. It is reasonable to expect that trust encourages positive attitudes toward sharing information and that trust and privacy concerns will be negatively correlated (Lee and Cranage, 2011).

In their study, Hong and Thong (2013) found that online customers felt the release of personal information important in their interaction with websites, however, they had little control over how their information would be managed once released. Customers are more willing to release personal information if they feel they will have control over the management of their information. One of the reasons why online customers avoid performing online financial transactions is the threat of information privacy which pushes them away from providing personal and sensitive information.

2.6.3 Customers' Trust in Internet Banking Transactions

It was pointed out by Adesina and Ayo (2010) that the low acceptance of Internet banking is due to lack of trust, which is due to security reasons, and lack of credibility in the system. This idea was suported by Gholam (2012), who said that the behavioural intention to use e-commerce, Internet banking included, is influenced by customers' trust. Yousafzai et al. (2007) point out that customers' trust in Internet banking transactions has some unique dimensions, that is, the impersonal nature of the online environment and the inherent uncertainty of using an open infrastructure for transactions. Moreover, there are concerns about its reliability and the extensive media coverage about frauds committed on the Internet which pose a unique challenge for banks to find ways and means to initiate and foster electronic relationships with customers. Popoola and Arshad (2015) revealed that trust plays a vital role in acceptance and usage of Internet banking, hence applying appropriate strategies to build customers' trust is essential for the service providers. Other findings from their research include customer orientation,

information technology development security strategy, institution-based trust and viable marketing.

Trust is the extent to which the customer believes that Internet banking is safe and has no privacy threats (Chong et al., 2010:273). Moreover, trust can also be defined as “an individual’s confidence in the intentions and capabilities of a relationship partner and the belief that a relationship partner would behave as one hoped” (Zhao et al., 2010, p.7). Banks can build mutually valuable relationships with their online customers through a trust-based collaboration process. The increased usage of Internet banking depends on the bank’s ability to convince the customers to bank online, an act that is unlikely to occur if the bank is perceived as untrustworthy.

Olasanmi’s study (2010) revealed that trust and fear have an impact on Internet banking consumers who are victims of Internet fraudulent activities. One of the limitations of this research is that the findings were verified via a small sample of respondents through interviews and focused mainly on bank customers alone. Furthermore, this study was focused on Nigeria which might have some impact on the result. The findings of Olasanmi (2010) were supported by Popoola (2013) who explored qualitatively the effect of trust on adoption and usage of Internet banking in Nigeria. The output of the study revealed that bank customers who are non-users of Internet banking lack trust in Internet banking and the users of Internet banking have partial trust in it. This lack of trust is rooted from a lack of security, bad reputation of banks, poor technology and lack of assuring policy or guarantee.

Trust is vital in online transactions because of the risk and uncertainty associated with the services and lack of physical presence of the parties involved in the transaction. Trust, together with the economic values and perceived risks, is a strong factor that determines the behaviour of online customers (Azam and Qiang, 2012). The existence of legal regulation increases trust and the legal regulation of banking activity is important to protect both the customer and the bank.

Andrews and Boyle (2008:61) argued that organisations providing online transaction facilities seek to mediate consumer perceptions of risk by increasing consumer trust in their online store. Once a consumer feels safe and receives the financial backing of the legislative law in place, the user feels more confidence toward conducting online business including Internet banking services. This idea was supported by the study of Dimitriadis et al. (2011, p.12) who conducted a survey of 762 bank customers in Greece and looked into the potential for extending their utilisation of banking services such as phone banking and the Internet. The findings of their study revealed that segmentation on the basis of attitudes and behaviours, with “high trustees” those more likely to adopt these new services, being more informed, most innovative and technology familiar, and more frequent users of bank services, including being frequent ATM users, than their low trusting counterparts. Consumer confidence requires banks to consider the security dimension, with both a technical aspect and a psychological aspect, since one of the most important factors in the decision of customers to use Internet banking is their perception of security (Sayar and Wolfe, 2007, p.131).

Eriksson et al. (2007) extend the applicability of the Innovation Adoption Model

developed by Everett Rogers to Estonian Internet banking. Their findings revealed that in countries with high volumes of other online activities, people are more used to doing transactions over the Internet, so they are not afraid of misuse of their personal information. If Internet banking is an everyday phenomenon rather than an innovation, risk is considerably reduced as a large userbase serves as an endorsement for the service. Perceived risk and security issues can be addressed on three levels: overall trust in the service provider, trust in the technology and trust in data security. In Estonia, where there is a high volume of online activities, the consumers are not afraid of misuse of their personal information. As pointed out by the authors, one limitation of the study was that it was only conducted in Estonia, and, therefore, the findings may be specific to the culture of this country and it would be better if future research could examine how these results hold up in a cross-cultural study. In Estonia, the adoption of Internet banking has been rapid, and, therefore, it would be interesting to compare the Estonian case with other markets where the adoption has not proceeded as rapidly.

The findings of Ericksson et al. (2007) were contradicted by Yousafzai et al. (2007) who explained that customers' perceptions of a bank as a trustworthy Internet banking provider also have a direct effect on their trust. The direct influence of perceived risk on intentions is related to the notion of perceived behavioural control in the Theory of Planned Behaviour (Ajzen, 1991). The distant and impersonal nature of the online environment and the implicit uncertainty of using a global infrastructure for transactions can bring about several risks that are either caused by functional defects or security problems or by the conduct of parties that are involved in the online transaction (Pavlou, 2003).

The findings of Ericksson et al. (2007) and Pavlou (2003) were supported by Becerra and Korgaonkar (2011) in their study of the effects of trust beliefs on consumers' online intentions. Although their study was conducted to ascertain online shopping intentions, the conclusion that trust developed through vendor, brand and product trust were found to affect intentionally (as a surrogate for behaviour) may have implications for research on the Internet banking uptake. In particular, the influence of information in developing faith based on competence, benevolence, integrity and predictability was of interest (Becerra and Kogaonkar, 2011:939). Likewise, to lend support to these findings, Montazemi and Saremi (2013) pointed out that lack of structural assurances increases the uncertainty about the security and privacy of online interactions and transactions with the Internet bank that hinder consumers' intentions to adopt it. Furthermore, consumers' propensity to trust depends on the degree of personal innovativeness and word-of-mouth that they receive through their social networks. In summary, it could be seen that trust is a key variable in the decision making surrounding Internet adoption, but not in isolation.

2.6.4 Information Quality

Information quality is defined as the quality of information that the online banking information system delivers to its users, and is measured in terms of accuracy, currency, completeness and format (Nelson et al., 2005). Online banking web-based systems provide users the means to access information systems directly by performing transactions. Hsueh-Ying Wu et al. (2010) undertook a study on bank customers' perceived usefulness adopting online banking. Their study was

intended to develop a comprehensive conceptual framework from which researchers could empirically examine and explain the relationship between customers' perceived usefulness of online banking in Taiwan and some identified variables like information quality. Interestingly, the findings revealed that relative advantages, trust and perceived ease of use are more important and critical to customers' intention of online banking adoption. Furthermore, the authors suggested that in designing online banking services, software developers should pay close attention to informative content that would be perceived by customers as useful and relevant.

Wang and Pho (2009) focused on identifying the determinants of customer intention to use online banking in which the authors developed a research framework based on the DeLone and McLean (2003) Information System Success to identify the factors that can affect customer intention to use online banking. Their study revealed that website information quality depends on delivering relevant, updated, and easy-to-understand information to significantly influence the attitude, satisfaction and purchase/use of bank online services. Moreover, Wang and Pho pointed out that information quality can be measured using information relevance, currency and understandability. The authors further noted that information relevance includes the relevant depth, scope and completeness of information that can affect bank expertise.

In the same manner, Harold (2012) undertook an empirical evaluation of the role of information quality on its success in the Indian financial services sector in order to broaden the understanding of this factor through which information technology

spreads its influences on banking success. The study examines how banking technology has benefited through information quality wherein a total of 499 valid observations were collected and analysed using the multiple regression technique. The output of the study suggests that information quality has positive effects on the banking success. However, the research reveals an important gap in the research literature wherein the linkage between information quality and organisational output through user satisfaction has only been minimally examined with relatively little theoretical grounding. One limitation of the study was the extent to which the responses accurately reflect the perspectives of the participants, and the extent to which those perspectives reflect the real world situation under investigation. According to the authors, these limitations can be mitigated through rigorous attention to the design of the survey instrument and the extent of the limitation can be assessed by analysing the construct validity of the instrument.

Table 2.2 Summary of Research Associated with Internet Banking

Authors	Key Factors and Concepts	Findings
Abdulah (2013); FDIC (2016); Omariba (2012 Pavlou (2011); Lee and Cranage (2011); Hong and Thong (2013); Pope and Lowen (2009,	Privacy	Studies have found that the single greatest factor influencing online purchase behaviour is a concern over control of private

p.303); Lee et al. (2011:203); Horn and Kellye (2006); Cristobal et al. (2007, p.331); Mukherjee and Nath (2007:1194)		information, and it can be assumed that conducting banking transactions online will raise similar questions about privacy risk.
Chorng-Shyong Ong (2015); Zhao et al. (2010:8); Chang and Ho (2006, p.345); Eriksson et al. (2008:165)	Security	Perceived security is an important factor that influences individuals' Internet banking adoption. Due to security issues ranging from privacy disclosure to financial loss, individuals whose willingness to apply online service may be lessened.
Popoola and Arshad (2015); Adesina and Ayo (2010); Gholam (2012);	Trust in Internet banking transactions	Trust, together with the economic values and perceived risks, is a

Olasanmi (2010); Popoola (2013); Azam and Qiang (2012); Becerra and Korgaonkar (2011); Becerra and Kogaonkar (2011:939); Montazemi and Saremi (2013); Andrews and Boyle (2008:61); Dimitriadis et al. (2011, p.12); Chong et al. (2010:273); Zhao et al. (2010, p.7); Sayar and Wolfe (2007, p.131); Eriksson et al. (2007); Yousafzai et al. (2007); Pavlou, 2003); Yousafzai et al. (2007)		strong factor that determines the behaviour of online customers. The existence of legal regulation increases trust and the legal regulation of banking activity is important to protect both the customer and the bank.
Harold (2012); Hsueh-Ying Wu et al. (2010); Wang and Pho (2009); DeLone and McLean (2003); Nelson et al.	Information quality	Website information quality depends on delivering relevant, updated, and easy-to-understand information

(2005)		to significantly influence the attitude, satisfaction and purchase/use of bank online services.

2.7 Cultural Impact on Technology Adoption

Culture plays an important role toward a better understanding of information system adoption (Hofstede, 1980; Sanna et al., 2010; Akour et al., 2006; Li et al., 2009). Hence, there is a need to explore the role of national culture as one of the factors that is likely to influence the acceptance or resistance of electronic banking services.

Lee et al. (2013) looked into the impact of Type I and Type II cultural differences on mobile phone adoption patterns. The study used Hofstede's cultural dimensions to examine cultural differences of two countries: Type I – the US and Type II – South Korea, and employed the Bass Diffusion Model to delineate innovation and imitation effects on mobile phone adoption.

The findings revealed that in individualistic cultures, people tend to look for information on their own from direct and conventional sources, whereas in collectivistic cultures, people rely more on subjective evaluation of an innovation, conveyed from other like-minded individuals who have already embraced the innovation (Lee et al., 2013).

This idea was supported by Baker et al. (2010), as shown in Table 2.3, who studied the cultural impacts on acceptance and adoption of information technology in a developing country. Their study revealed that despite incredible advances in technology, organisations are still facing the problems of under-utilisation or rejection of implemented technologies. According to the authors, the vast number of findings on adoption and use of organisational information systems in developed nations are not necessarily applicable to less developed nations due to differences in cultural social norms, beliefs and behaviours. This means that the impact of social influence processes, such as subjective norm, voluntariness and image, on an individual's acceptance of technologies in developing countries, such as the GCC, might differ substantively from industrialised Western nations, such as those in North America and Western Europe. It could be said that there is cultural variation that exists in every nation and national cultures vary along dimensions of orientation to time, authority or power, communication, community, formality, goal-orientation, performance orientation, space and structure – all dimensions that would influence business practices (Hofstede, 2001; Stohl, 2001).

National culture is defined as a "collective programming of the mind which distinguishes the members in one human group from another" (Hofstede, 1997, p.21). Hofstede (1980) based his five dimensions of culture on an extensive survey at IBM in which he investigated the influence of national culture. By filtering out IBM's dominant corporate culture from his data on IBM's national subsidiaries, Hofstede was able to statistically distinguish cultural differences between countries (Hofstede, 2003). According to McCoy et al. (2007), most research on national culture uses Hofstede's measures and concepts, including those who disagreed

with his dimensions. It was noted that Hofstede's national culture framework has been criticised due to some methodological weaknesses (Baskerville, 2003), however, Leidner and Kayworth (2006) found, after an extensive literature review of national culture studies, that over 60% of these studies used one or more of Hofstede's cultural dimensions; for instance, Sanna et al.'s (2010) study of the impact of culture on adoption, concentrating on the adoption of wireless communications and using penetration data from 64 countries. Their findings revealed that masculinity has no effect on the diffusion, whereas uncertainty avoidance has the greatest effect.

Furthermore, Akour et al. (2006) examined Internet usage, and the impact of four of Hofstede's cultural dimensions, perceived ease of use (PEOU), and PU of managers' intentions in Jordan. They found that power distance and collectivism impacted significantly and positively, whilst, uncertainty avoidance and femininity had no impact at all.

A study was made by Kanagaretnam et al. (2011) on the extent to which cultural differences influence bank risk-taking by using a sample of banks from 45 countries. The study measured the cultural differences using country level indices for uncertainty avoidance and individualism developed by Hofstede (2001). The cross-country analysis indicates that uncertainty avoidance is negatively, and individualism positively, related to bank risk-taking. These results hold even after controlling for previously identified factors associated with bank risk-taking, under-scoring the importance of softer dimensions such as national culture that may influence excessive risk-taking.

In another study, Zakour (2007) explored IT adoption and reported that individual users are more concerned about their own opinion. However, the opposite is true for the collectivists. Individuals from feminine cultures care more about other's opinions than those from masculine cultures. Those from high power distance cultures care less about their superiors' opinions; high uncertainty avoidance cultures are more respectful of regulations; high context cultures prefer unwritten messages, but the opposite is true in low context cultures. High power distance cultures are less accepting of IT than those from low power distance cultures. Masculine cultures are more established for IT usage, because the use of IT is associated with accomplishing their goals.

Moreover, Li et al. (2009) investigated how national culture affects the acceptance of global websites. Five national cultural dimensions were measured by integrating both the moderating and direct effects of cultural values, in the scope of the US and China; they found that individualism and time orientation influences PEOU and PU, directly. Four of Hofstede's dimensions had no significant moderating effect on the relationship between social influence and intention. The studies reviewed generated contrary results, such as by Zakour (2007) and Strite (2000) who examined IT adoption, resulting in the impact of cultural dimensions. Different results by Li et al. (2009) found that four of Hofstede's dimensions had no effect.

2.7.1 Hofstede's Cultural Dimensions

Since Hofstede's definition of culture and his theoretical framework are widely recognised and accepted, they have also been chosen in this research as a

theoretical background to assess the impact of the national culture on the adoption of Internet banking. According to Hofstede, values represent: “the deepest level of a culture”. The five dimensions of culture according to Hofstede are: power distance, individualism vs collectivism, masculinity vs femininity, uncertainty avoidance and time orientation. Hofstede has previously undertaken values surveys of over 50 countries, including the Arab world, which he defines as including Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia and the United Arab Emirates. In spite of its rapid economic development, Bahrain remains, in many respects, essentially Arab in its culture. So, the five dimensions of cultural attitudes are discussed regarding the fact that Bahrain is generally Arab in its ethnic origin.

Power distance: the extent to which the less powerful members of organisations accept that power is distributed unequally (Wei et al., 2008). In technological usage, high power distance users pay more attention to the community’s reaction to the technology, and then modify their reaction, relying on their place within the hierarchical structure. However, low power distance users are more independent in their technology use (Li et al., 2009). The first dimension is power distance, which measures the way in which different cultures approach and accept inequalities between individuals of a society. A typical high score for this dimension would be characteristic of a culture with a paternalistic decision-making style where the employee or the subordinate is afraid to manifest his disagreement with the superior and is rather glad to accept his superior’s decisions. Inequality is accepted and even desired in such cultures and is manifested in all areas of the society: high income differences, parents and professors are viewed as authority and their relationship to children may be characterised in terms of unilateral respect and

obedience. Subordinates do not take any initiative but prefer to be directed by superiors. Politically there is an indissoluble connection between power-wealth-capacity and privileges, and the power is based on relationships (family, friends etc); religion or different types of hierarchies and bureaucracies are strong. There is no middle class, and political change is expected to be achieved by revolution.

Individualism versus collectivism: this refers to the degree to which people are supposed to look after themselves or remain integrated into groups and family (Wei et al., 2008). In high collectivist cultures, users have a tendency to focus more on the community to which they belong. They are more impacted by their peers and superiors, by satisfying their opinions; however, the opposite occurs in individualistic cultures. In technology adoption and use, high collectivism users care more about regarding how their community is possibly affected by their adoption behaviours (Li et al., 2009). This dimension is intended to assess the role of the individual and of the group in a given society.

Through his research Hofstede points out a correlation between wealth and individualism. Denmark, with a score of 74, ranks among the top ten individual countries. An individualist culture is manifested by the predominance of individuals' interests over the group interests. Relationships between individuals are rather loose; the sources of personal achievement are profession and family. Privacy is important and relationships at work are quite superficial. The behaviour is regulated by guilt and individual conscience. Individual skills are appreciated and work contracts take into account reciprocal advantages for both parts. Economic and commercial relations are based on reciprocal profit and the employment of the most

advanced methods and techniques.

Masculinity versus femininity: the degree to which tough values, such as assertiveness, performance, success and competition (which are associated with the role of men), prevail over tender values, such as quality of life, maintaining warm personal relationships, service, care for the infirm and solidarity (which are associated with women's roles) (Wei et al*.,* 2008). In using technology, feminine users usually care more about building relationships with other users than the technology itself. They focus on maintaining interdependency and accepting others' suggestions and desires. Users with feminine values are expected to conform to social pressures more than those with highly masculine values (Li et al., 2009). The third cultural dimension takes into account gender roles: masculine is equated with assertiveness while feminine is synonymous with modesty.

Denmark ranks among the most feminine cultures (with a low score of 16 for masculinity), which put emphasis on good relationships and cooperation, charity and modesty. Safety and family are very important values. Gender roles often overlap; failure is regarded as an accident and not as a disaster (as would be the case with masculine cultures). Caring and tender attitudes or the expression of weakness is not disregarded. On the political level the ideal is a universalistic welfare state whose primary goals are democracy, support and assistance for everybody, and concerns for environmental issues. Conflicts are not solved by strike but by compromise and negotiation.

Uncertainty avoidance: the extent to which a culture programmes its members to

feel either uncomfortable or comfortable, in unstructured situations. Unstructured situations are novel, unknown, surprising or different from usual (Wei et al., 2008). In high uncertainty avoidance cultures, users have a low tolerance of the unknown and risk. When high uncertainty avoidance users do not avoid ambiguous situations, they will seek easy rules, in order to lessen the ambiguity. Generally, high uncertainty avoidance users are expected to comply with their community beliefs more in adopting technology; the reverse is true for low uncertainty avoidance culture users (Li et al., 2009).

According to the last Hofstedian dimension, uncertainty avoidance measures the level of risk aversion in a society. Cultures with a high score will refrain from taking risks and testing new methods, preferring the tried and tested ways. On the contrary a low score of this dimension indicates a culture willing to try new ways and approaches, where a high degree of innovation may be witnessed. Low stress, positive feelings prevail while strong emotions, violence and aggression are sanctioned. The population is very open to the diversity. Rules are minimal, laws are general and few, self-regulatory codes numerous. Competence overrules authority, protest is accepted and there is no one expert and only possessor of the eternal and unique truth.

Long-term time orientation means focusing on the future. It implies a cultural trend towards delaying immediate gratification, by practising persistence and thriftiness. In contrast, short-term time orientation means focusing on the past and present, by respecting tradition and through a need to follow spending trends (Wei et al., 2008). The technology's usage nature shapes the users' perceptions, because they have

different time orientations. As users with short-term orientation values are concerned with the difficulty of beginning to learn the usage technology, users with long-term orientation values look forward to the learning process and practising, and how it would be easy to use the technology. Long-term users perceive that the support of technology will improve their performance next time; they are also patient and enthusiastic in affording extra effort to accomplish in their future, while the opposite is true for short-term oriented users (Li et al., 2009).

Table 2.3 Summary of Research on Cultural Impact of Technology Adoption

Authors	Key Factors and Concepts	Findings
Baker et al. (2010)	The unique effects of Saudi culture on IT adoption within the developing, non-Western, country.	The authors' findings contribute to understanding the effects of cultural contexts in influencing technology acceptance behaviours, and demonstrate the need for research into additional cultural factors that account for technology acceptance.

Kanagaretnam et al. (2011)	The study measured the cultural differences using country level indices for uncertainty avoidance and individualism developed by Hofstede (2001).	The cross-country analysis indicates that uncertainty avoidance is negatively, and individualism positively, related to bank risk-taking. These results hold even after controlling for previously identified factors associated with bank risk-taking, underscoring the importance of softer dimensions such as national culture that may influence excessive risk-taking.
Lee et al. (2013)	Impact of Type I and Type II cultural differences on mobile phone adoption patterns using Hofstede's cultural dimensions.	In individualistic cultures, people tend to look for information on their own from direct and conventional sources, whereas in collectivistic

		cultures, people rely more on subjective evaluation of an innovation, conveyed from other like-minded individuals who have already embraced the innovation.
Gupta et al. (2008)	The role of organisational culture in the adoption of Internet technology in a government agency in a developing country, India.	Found that organisational culture influences the adoption of Internet technology.
Sanna et al. (2010)	The impact of culture on adoption, concentrating on the adoption of wireless communications.	Masculinity has no effect on the diffusion, whereas uncertainty avoidance has the greatest effect. Ultimately, a more reliable and extensive study could be conducted if Hofstede's cultural indices were

		available for more countries.
Zakour (2004); Durfee et al. (2006); Srite and Karahanna (2006); Akour et al. (2006); Zakour (2007); Li et al. (2009)	Hofstede's cultural dimensions were assessed by integrating both the moderating and direct effects of cultural values on IT adoption.	The studies reviewed generated contrary results, such as by Zakour (2007) and Strite (1999) who examined IT adoption, resulting in the impact of cultural dimensions. Different results by Li et al. (2009) found that four of Hofstede's dimensions had no effect.

2.8 Biometric Technology

Biometrics are automated methods of recognising customers through their biological characteristics and traits such as fingerprints, finger vein patterns, iris and voice recognition (Trader, 2014). While there is no doubt that Internet banking transactions should have layered protection against security threats, the providers should approach security considerations as part of their service offerings (Nasir and Yunos, 2005).

Many banks worldwide are already using biometrics with their banking systems to

authenticate employees and customers and among all banks utilising biometrics, 52% are located in Asia. Japan has more than an estimated 15 million customers using biometric authentication for banking transactions. Banks in Mexico, South America, Africa and the Middle East are also moving towards the use of biometric identification technology because of its popularity with consumers, and ability to offer more security than traditional personal identification numbers (PINs) and passwords (Trader, 2014).

Biometric characteristics are unique for every individual and difficult to forge, which is why biometric verification and authentication is commonplace in immigration control, law enforcement and forensic studies (Trader, 2014).

Nasir and Yunos (2005) explained that easy access and convenience of Internet banking should not be at the expense and mercy of the security of information. At this point, the authors presented several methods of ensuring more secure Internet banking. The first authentication factor can be the use of passwords and the second authentication factor can be the use of tokens such as a smartcard. However, for better security, a three-factor authentication process should be considered. The third authentication factor is the use of biometric technology such as iris or thumbprint recognition. With three-factor authentication a more secure method can be implemented – a password to ascertain what one knows, a token (smartcard) to ascertain what one has, and biometric recognition (for example fingerprint or thumbprint) to ascertain who one is biologically. With this authentication, if passwords have been compromised, fraudsters need to get through another two levels of authentication to access a customer's account.

Sarma and Singh (2010) stressed that transaction risks are the current and prospective risk to earnings and capital of banks arising from fraud, error and inability to deliver products and services. According to the authors, biometric technology is also one of the most important technologies for risk management as well as security factors of Internet banking. Biometric technology is applied in cases of authentication, as a way to verify the buyer's identity before payments are made.

Umico (2015) stated that London-based consultants Goode Intelligence predicted that some 450 million bank customers globally will use biometrics, which will be the principal banking authentication method by 2020. In a new report, "Biometrics for Banking; Market and Technology Analysis, Adoption Strategies and Forecasts 2015-2020", Goode Intelligence revealed that biometrics in banking is already a maturing industry with many successful implementations around the world.

The single most important factor affecting the adoption of biometrics is the cost of the biometrics systems, which includes the cost of the sensors, and the related infrastructure. Additionally, biometric technologies requiring very little cooperation/participation from users (e.g. face and thermograms) may be perceived as more convenient to users. However, a related issue is public acceptance as there may be a generally prevalent perception that biometrics are a threat to the privacy of an individual (Sharma and Singh, 2010).

2.9 Problem Statements and Gaps

The literature review produced the following problem statements and gaps:

First, Internet security is a global issue requiring coordinated, global actions to improve security at all levels. The responsibility for Internet security lies not only at the individual level, but also at the level of government, software manufacturing, the commercial sector and international organisations.

Second, studies have found that the single greatest factor influencing online purchase behaviour is a concern over control of private information, and it can be assumed that conducting banking transactions online will raise similar questions about privacy risks. Technology's growing capacity for information processing, plus its complexity, have made privacy an increasingly important issue and the most important determinant of consumer confidence.

Third, it was noted that despite the benefits of online banking information systems, technological developments alone cannot guarantee the acceptance and the use of systems by potential customers. Trust developed through vendor, brand and product trust, which were found to affect intentionally (as a surrogate for behaviour), may have implications for research on Internet banking uptake.

Fourth, trust is vital in online transactions because of the risk and uncertainty associated with the services and lack of physical presence of the parties involved in the transaction. Trust, together with the economic values and perceived risks, are strong factors that determine the behaviour of online customers (Azam and Qiang, 2012).

Fifth, if Internet banking is an everyday phenomenon rather than an innovation, risk is considerably reduced as a large userbase serves as an endorsement for the service. Consumers are often concerned about Internet banking security, and this concern affects their adoption decisions (Howcroft et al., 2002).

Sixth, the Technology Acceptance Model constitutes a solid framework for identifying issues that may affect user acceptance of technical solutions, however, Davis (1989) did not include external variables explicitly into the model that are expected to influence intentions and usage through PU and PEOU, like system characteristics, organisational structure, individual difference and the like.

Seventh, risk and security of transactions in Internet banking is a very hot issue and it is an important factor that customers consider before adopting or using Internet banking. Some customers avoid Internet banking as they perceive it as being easily prone to dishonesty.

Eighth, culture plays an important role toward a better understanding of information system adoption (Hofstede, 1980; Sanna et al., 2010; Akour et al., 2006; Li et al., 2009). Hence, there is a need to explore the role of national culture as one of the factors that is likely to influence the acceptance or resistance of Internet banking services.

Ninth, while biometric technologies may be perceived as more convenient to users, a related issue is public acceptance. There may be a generally prevalent perception that biometrics are a threat to the privacy of an individual.

The problem statements and gaps are presented in Table 2.4.

Table 2.4 The Gap Table

Research Aspect	**References**	**Key Factors (Dimensions and Concepts)**	**Problem Statements and Gaps**
Security of banking transactions	Zhao et al. (2010:8); Chang and Ho (2006, p.345)	Data security	Data security is a major issue for businesses, public bodies and consumers where banks are no exception.
	Gorman (2007:561)	Online security	Internet security is a global issue requiring coordinated, global actions to improve security at all levels.
	Gorman (2007:563)	Internet security	The responsibility for Internet security lies not only at the individual level, but also at the level of government, software manufacturing, the commercial sector and

			international organisations.
Privacy	Dolnicar et al. (2007); Pope and Lowen (2009)	Privacy risk	Studies have found that the single greatest factor influencing online purchase behaviour is a concern over control of private information, and it can be assumed that conducting banking transactions online will raise similar questions about privacy risk.
	LaRose and Rifon (2007, p.303)	Privacy risk	Privacy policies have often been confusing, rarely read by online consumers.
	Horn and Kellye (2006)	Privacy risk	All “financial institutions” are required to maintain records of certain types of financial transactions and to file detailed reports describing activity judged to be “suspicious”. The data in these reports are accessible electronically, without notice, warrant or probable

			cause by every US Attorneys' Office and some 60 law enforcement agencies including the FBI, Secret Service and the Customs Service.
	Cristobal et al. (2007); Jalal (2011); Mukherjee and Nath (2007:1194)	Privacy risk	Technology's growing capacity for information processing, plus its complexity, have made privacy an increasingly important issue.
Trust	Zhao et al. (2010)	Trust and perceived risk	Trust is viewed as a "risk reliever" (op. cit., p.8), but both trust and perceived risk were 'multi-dimensional constructs' related to the individual, cultures and contexts.
	Alsajjan and Dennis (2010); Al-Somali et al. (2009); Yiu et al. (2007); Yousafzai	Trust	It was noted that despite the benefits of online banking information systems, technological developments alone cannot guarantee the acceptance and the use of

	(2005); Pikkarainen et al. (2004); Wang et al. (2003)		systems by potential customers.
	Becerra and Korgaonkar (2011)	Trust	Trust developed through vendor, brand and product trust, which were found to affect intentionally (as a surrogate for behaviour), may have implications for research on the Internet banking uptake.
	Azam and Qiang (2012)	Trust and perceived risk	Trust is vital in online transactions because of the risk and uncertainty associated with the services and lack of physical presence of the parties involved in the transaction.
Information quality	Wang and Pho (2009)	Information quality	Information quality can be measured using information relevance, currency and understandability. The authors

			further noted that information relevance includes the relevant depth, scope and completeness of information that can affect bank expertise.
External variables	Davis (1989)	The Technology Acceptance Model	Davis (1989) did not include external variables explicitly into the model that are expected to influence intentions and usage through PU and PEOU, like system characteristics, organisational structure, individual difference and the like.
Cultural factors	Baker et al. (2010); Sanna et al. (2010)	Cultural factors	There is a need for research into additional cultural factors that account for technology adoption. A more reliable and extensive study could be conducted if Hofstede's cultural indices were available for more

			countries.
	Hofstede (1980); Sanna et al. (2010); Akour et al. (2006); Li et al. (2009)	Cultural dimensions	There is a need to explore the role of national culture as one of the factors that is likely to influence the acceptance or resistance of electronic banking services.
Perceived risks	Huang et al. (2011)	Security risk	Security risk is one of the important factors that can have an influence on adoption of online banking services and the gap between the perceived security of a technology and its real security level can affect the behaviour of people.
	Manoranjan et al. (2012)	Risk and security	Risk and security of transactions in Internet banking is a very hot issue and it is an important factor that customers consider before adopting or using Internet

			banking.
Biometric technology	Nasir and Yunos (2005)	Security requirements	While there is no doubt that Internet banking transactions should have layered protection against security threats, the providers should approach security considerations as part of their service offerings.
	Sharma and Singh (2010)	Biometric issues	While biometric technologies may be perceived as more convenient to users, a related issue is public acceptance. There may be a generally prevalent perception that biometrics are a threat to the privacy of an individual.

2.10 Chapter Summary

This chapter has discussed previous research regarding established factors known to have an impact on the uptake of Internet banking services in other parts of the world. The review has produced certain factors as determinants or barriers to the adoption of Internet banking which fall under the themes of security, trust, privacy, information quality, perceived risks and benefits, cultural factors and biometric technology. Based on the literature review, the TAM has been chosen as the basis of this research for the main reason that it has tremendous flexibility to be extended and applied to many different information systems. Moreover, it was mentioned in the literature that external variables were explicitly excluded from the model that are expected to influence intentions and usage like system characteristics, organisational structure, individual difference and the like. For this reason, two additional factors were included in this study, the cultural factor and biometric technology that may also affect or influence the adoption or acceptance of an online banking in the Kingdom of Bahrain. From the literature reviewed and analysed, the problem statements and gaps were identified from which the conceptual framework of the study. From this identified problem statement and gaps, a possible conceptual framework is outlined in which investigation is based on how the adoption of Internet banking in Bahrain is described.

First, Internet security is a global issue requiring coordinated, global actions to improve security at all levels. The responsibility for Internet security lies not only

at the individual level, but also at the level of government, software manufacturing, the commercial sector and international organisations.

Second, studies have found that the single greatest factor influencing online purchase behaviour is a concern over control of private information, and it can be assumed that conducting banking transactions online will raise similar questions about privacy risk. Technology's growing capacity for information processing, plus its complexity, have made privacy an increasingly important issue and the most important determinant of consumer confidence.

Third, it was noted that despite the benefits of online banking information systems, technological developments alone cannot guarantee the acceptance and the use of systems by the potential customers. Trust developed through vendor, brand and product trust, were found to affect intentionally (as a surrogate for behaviour) may have implications for research on the Internet banking uptake.

Fourth, trust is very vital in online transaction because of the risk and uncertainty associated with the services and lack of physical presence of the parties involved in the transaction. Trust, together with the economic values and perceived risks are strong factors that determine the behaviour of online customers (Azam and Qiang, 2012).

Fifth, if Internet banking is an everyday phenomenon rather than an innovation,

risk is considerably reduced as a large user base serves as an endorsement for the service. Consumers are often concerned about Internet banking security, and this concern affects their adoption decisions (Howcroft et al., 2002).

Sixth, the Technology Acceptance Model constitutes a solid framework for identifying issues that may affect user acceptance of technical solutions, however, Davis' (1989) did not include external variables explicitly into the model that are expected to influence intentions and usage through PU and PEOU like system characteristics, organisational structure, individual difference, and the like.

Seventh, risk and security of transactions on the Internet banking is a blistering issue and it is an important factor that customers consider before adopting or using Internet banking. Some customers avoid Internet banking as they perceive it as being easily prone to dishonesty.

Eight, culture plays an important role toward a better understanding of information system adoption (Hofstede, 1980, Sanna et al., 2010; Akour et al., 2006; Li et al., 2009). Hence, there is a need to explore the role of national culture as one of the factors that is likely to influence the acceptance or resistance of Internet banking services.

Ninth, while biometric technologies may be perceived as more convenient to

users, a related issue is public acceptance. There may be a generally prevalent perception that biometrics are a threat to the privacy of an individual.

3.0 CHAPTER 3

3.1 Conceptual Framework

In this section, the conceptual framework of the study is discussed which explains the key variables to be studied in the research. The first section discusses the conceptual framework development followed by various themes which include: Perceived Privacy Protection, Perceived Security Protection, Perceived Trust, Perceived Information Quality, Perceived Risks and Benefits, Cultural Dimensions and their Relationship to Technology Acceptance, and the Adoption of Internet Banking and Biometrics Technology towards the use of Internet banking.

3.2 Conceptual Framework Development

The literature reviewed in Chapter 2 has produced the problem statements and gaps which served as bases for the conceptual framework of the study. The identified constructs help the researcher in developing the conceptual model which can possibly influence the behavioural intention towards acceptance of online banking. Initially, the Technology Acceptance Model (TAM) developed by Davis (1989) serves as the basis of developing a conceptual model which could also be relevant to how consumers accept or reject Internet banking services. As stated earlier, this model has been chosen since it has tremendous flexibility to be extended and applied to many different information systems. The constructs

identified in the previous chapter, which are contributory to the adoption of Internet banking services, are discussed here in greater detail. In this study, five variables were initially chosen, namely, perceived privacy protection, perceived security protection, perceived trust, perceived information quality and perceived risks/benefits. Besides the five variables, two more variables were included – cultural dimension and biometric technology – to measure a significant relationship with any of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain.

The conceptual model is presented in Figure 3.1. From the model it is shown that the three upper boxes represent the constructs of perceived privacy protection, perceived security protection and perceived trust which may positively affect the intention of customers to use Internet banking. The two lower boxes represent the constructs of perceived information quality and perceived risk benefits that may also positively affect the intention of customers to use Internet banking. Two additional constructs were included as shown in the middle left boxes – cultural dimensions and biometric technology – which may positively affect the intention of customers to use Internet banking.

3.3 Dependent Variable – Behavioural Intention Towards the Use of Internet Banking

In this study, the behavioural intention towards the use of Internet banking serves as the dependent variable. The behavioural intention (BI) is defined as a person's perceived likelihood, or "subjective probability that he or she will engage in a

given behaviour" (Committee on Communication for Behaviour Change in the 21st Century, 2002, p.31). BI reflects how hard a person is willing to try, and how motivated he or she is, to perform the behaviour (Ajzen, 1991). The Theory of Reasoned Action states that: "if people evaluate the suggested behaviour as positive (attitude), and if they think their significant others want them to perform the behaviour (subjective norm), this results in a higher intention (motivations) and they are more likely to do so". A high correlation of attitudes and subjective norms to behavioural intention, and subsequently to behaviour, has been confirmed in many studies (Sheppard et al., 1988).

As discussed in Chapter 2, many studies have identified various factors which influence the adoption of Internet banking acceptance. The study considered the factors that would be more relevant to Arab culture and especially to the Bahrain context, in addition to the five factors stated in the developed model, a biometric technology and cultural dimension are added to measure if a significant role of these constructs may affect customers' intention to use Internet banking.

The rationale behind the choice of biometric technology and culture as variables for further study are anchored on the following:

The literature review in Chapter 2 revealed that trust and fear have an impact on Internet banking consumers who are victims of Internet fraudulent activities. This was pointed out by Olasanmi (2010) and Popoola (2013), whose studies

exposed that bank customers who are non-users of Internet banking manifest their lack of trust, which emanates from perceived poor security practices, bad reputation of banks, poor technology and lack of policy assurance or guarantee.

Other factors that hinder bank consumers to adopt Internet banking are: the distant and impersonal nature of the online environment; the uncertainty of using a global infrastructure for transactions with associated risks or the conduct of parties that are involved in the online transaction; lack of structural assurances increases the uncertainty about the security and privacy of online transactions (Montazemi and Saremi, 2013). Along this line, risk and security of online transactions is a very hot issue that customers consider before adopting or using Internet banking (Manoranjan et al., 2012). Thus, Nasir and Yunos (2005) recommend that the providers should approach security considerations as part of their service offerings in which biometric technologies could be of help as part of the layered protection (Sharma and Singh, 2010). However, while biometric sensors continue to become less expensive and smaller in size, the negative perception of biometrics as encroachment on individual privacy continues to decline (Fatima, 2016). The main reason is that this technology is likely to be used in almost every transaction needing authentication of personal identities. Moreover, biometrics is actually an effective strategy for protection of privacy and detection of fraud, hence, the selection of biometric technologies as a significant variable in this study.

On the other hand, cultural factor was selected based on the gap identified in previous literature stating that there is a need for research into additional cultural factors that account for technology adoption (Baker et al., 2010; Lee et al., 2013; Gupta, 2012). These studies showed contrasting findings on the cultural impact of technology adoption using Hofstede's cultural dimensions. Undoubtedly, past studies assisted in providing insights into technology acceptance in general, however, they did not shed light on the uses of a specific technology. Technology adoption may be moderated by national culture (Pavlou and Chai, 2002; Straub, Keil and Brenner, 1997) and a more reliable and extensive study could be conducted if Hofstede's cultural indices were available for more countries (Baker et al., 2010; Sana et al., 2010). While the main criticism is that Hofstede's study is outdated and old-fashioned, culture is used to understand the different behaviours of people in different countries within an organisational context. As argued by Hofstede (1980; 2001), culture stays stable over time and merely changes slowly. Obviously, the reviewed literature points out that there is an influence of a powerful culture in technology adoption, so that the current investigation intends to fill in the gap identified by exploring the role of national culture as one of the factors that is likely to influence the acceptance or resistance of electronic banking services in the Kingdom of Bahrain.

It is worth mentioning the studies conducted in Arabic countries, for instance, Baker et al. (2010) who investigated technology adoption behaviour of Saudi Arabian knowledge workers using desktop computers within the context of

TAM2. The study delved into the unique effects of Saudi culture on IT adoption, which contributed to understanding the effects of cultural contexts in influencing technology acceptance behaviours, and demonstrated the need for research into additional cultural factors that account for technology acceptance. Similarly, another study was conducted in the Arabian context by Alhirz and Sajeev (2013), who examined the influence of espoused national cultural values of individuals on user acceptance of enterprise resource planning (ERP) systems. The findings revealed that the structural equation model did not show evidence for power distance and individualism influencing perceived user resistance and involvement with ERP, whereas uncertainty avoidance has a significant influence over perceived user involvement and user resistance with ERP.

Likewise, the study of Akour et al. (2006) examined the impacts of cultural dimensions, perceived ease of use (PEOU), and perceived usefulness (PU) of Jordanian managers' intentions to use the Internet. The findings revealed that two cultural dimensions, power distance (PD) and collectivism (CO), had significant positive impacts on managers' intentions to use the Internet, while the other two cultural dimensions, uncertainty avoidance (UA) and femininity (FE), and had no impact. The study recommends that organisations need to understand the influence of cultural values on computer technology acceptance by integrating societal and cultural values into their technological diffusion.

Based on these ideas, this study anchored its belief to contribute to the

understanding of the effects of cultural contexts in influencing technology acceptance behaviours. At this juncture, this study aims to offer a renewed insight into studying the uptake of the Internet by adopting Hofstede's cultural dimensions in order to gain a deeper understanding of cultural context that may open up new avenues on how Internet banking is accepted or rejected by bank customers in the Kingdom of Bahrain.

These factors are assumed to influence the behavioural intentions of bank customers in the Kingdom of Bahrain on how they adopt Internet banking services. In this study, the bank customers' acceptance of Internet banking is measured by their behavioural intention to use this technology. Each variable will be discussed in the succeeding section.

3.4 Factors Affecting Online Banking Adoption

3.4.1 Perceived Privacy Protection Towards the Use of Internet Banking

The first construct deals with the issue of perceived privacy protection as shown in Figure 3.1. Perceived privacy protection refers to a level of assurance that collection of various data during users' interactions with the bank are protected (Kim et al., 2008, pp.544-654). This implies that privacy concepts include the appropriate use and protection of data related to the technical aspects that ensure the integrity, confidentiality, authentication and non-repudiation of any

transactions (Chiu et al., 2009; Lee et al., 2011:205).

There are theoretical and empirical evidences that show a significant association between consumers' perceived privacy protection and the intention to use online transactions. For example, Mekovec and Hutinski (2012) argued that individual users are hesitant to use the services offered via the Internet because of their suspicions regarding the level of offered protection of their privacy and security of performing online transactions. Privacy cannot be achieved without obtaining security protection, nor will the usage of security mechanisms guarantee protection of privacy. Moreover, studies have found that the single greatest factor influencing online purchase behaviour is a concern over control of private information, and it can be assumed that conducting banking transactions online will raise similar questions about privacy (Dolnicar et al., 2007; Pope and Lowen, 2009). Based on the aforementioned literature, the following hypothesis is proposed*: H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain.*

3.4.2 Perceived Security Protection Towards the Use of Internet Banking

The second construct refers to perceived security protection, as reflected in the second box in Figure 3.1. Perceived security protection refers to a level of assurance that a particular transaction will be performed without any security breach. This term describes the consumers' perception that the Internet vendor

(the bank) will fulfil security requirements such as authentication, integrity and encryption (Kim et al., 2008, pp.544-654). Security measures will improve the way Internet banking users access their bank accounts. This will give users greater confidence in the confidentiality of their personal information and security of their finances.

The security of banking transactions, as well as the confidentiality of personal account data, are major issues for businesses, public bodies and consumers. This has something to do with the proliferation of scams, phishing and other methods of breaching Internet security which have highlighted the vulnerability of investments (Gorman, 2007:561).

Theoretical and empirical evidence show that there is a significant association between consumers' perceived security and intention to use Internet banking. For example McCole et al. (2010) incorporate privacy and security concerns as a moderating variable and find that these relationships vary depending on the level of concerns a consumer has when purchasing online. The study suggests that 'fears' surrounding the Internet as a place to do business still hinder the use of it for e-commerce purposes, but that the presence of a reputable agent might in some manner mitigate this risk. Hong et al. (2003) pointed out that the main goal of information security is to ensure the confidentiality of data within the system by establishing and upholding the integrity of data as well as the availability of information processing resources. Based on the literature above, the following

hypothesis is proposed: *H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain.*

3.4.3 Perceived Trust towards the Use of Internet Banking

The third box refers to the construct of perceived trust as shown in Figure 3.1. Trust is the extent to which the customer believes that Internet banking is safe and has no privacy threats (Chong et al., 2010:273). It is also defined as "an individual's confidence in the intentions and capabilities of a relationship partner and the belief that a relationship partner would behave as one hoped" (Deutsch, 1958, cited in Zhao et al., 2010, p.7). Trust is viewed as a "risk reliever" which is related to the "individual, cultures and contexts".

There are theoretical and empirical evidences that show a significant association between consumers' perception of trust and risk beliefs about online banking transactions. For instance, Harold (2012) undertook an empirical evaluation of the role of information quality on its success in the Indian financial services sector in order to broaden the understanding of this factor through which information technology spreads its influences on the banking success. Moreover, Popoola (2013) revealed that bank customers who are non-users of Internet banking lack trust in Internet banking and the users of Internet banking have partial trust in it. Likewise, Olasanmi (2010) imparted that trust and fear have an effect on Internet banking consumers who are victims of Internet fraudulent activities. The study of Yousafzai (2009) found out that in general, trust

improves the consumer's beliefs about e-retailers and the associated infrastructure, attenuating the perceived level of risk associated with the transaction process.

Lack of trust is one of the most frequently cited reasons why consumers avoid e-commerce transactions (Lee and Turban, 2001). This idea is supported by other authors who pointed out that those consumers who do not trust the seller will refuse to involve themselves in online transactions (Gefen et al., 2002; Kim et al., 2008). Therefore, online trust is a very important factor in determining the success of an online website (McKnight and Chervany, 2001; Balasubramanian et al., 2003; Grabner-Krauter and Kaluscha, 2003; Koufaris and Hampton-Sosa, 2004). Trust developed through vendor, brand and product trust, which were found to affect intentionally (as a surrogate for behaviour), may have implications for research on Internet banking uptake. Based on the literature reviewed, the following hypothesis is proposed: *H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain*.

3.4.4 Perceived Information Quality Towards the Use of Internet Banking

The fourth construct represents information quality. According to Wang and Pho (2009), website information quality depends on delivering relevant, updated and easy-to-understand information to significantly influence the attitude, satisfaction and purchase/use of online services. Moreover, information quality can be

measured using information relevance, currency and understandability. Information quality includes the relevant depth, scope and completeness of information that can affect bank services and trustworthiness.

Information quality refers to the quality of the information or the output that the system produces. The operational potential of information quality (Bailey and Pearson, 1983) depends on factors like accuracy, precision, currency, timeliness, reliability, completeness, conciseness, relevance and the preferred format. The other measures include sufficiency, understandability, freedom from bias, timeliness, reliability, relevance to decisions, comparability, quantitativeness (King and Epstein, 1983); completeness of information, accuracy of information (Miller and Doyle, 1987); ease of navigation, privacy and security (Molla and Licker, 2001; Palmer, 2002), as well as customisation, which are some of the system quality measures discussed by Delone and McLean (2003).

Theoretical and empirical evidence show that there exists a significant association between consumers' perception of information quality and adoption of Internet banking services. For example, the study of Pikkarainen et al. (2004) found that the amount of information available has a positive effect on the use of online banking. This means that the information provided in the virtual communities on the Internet must be accurate, complete, current, customised for the user and presented in an easy-to-use format (Nelson, Todd and Wixom, 2005). Information quality (IQ) denotes how good the system is in terms of its

output and it is measured by information accuracy, completeness, currency and format of information presentation (Nelson et al., 2005). Likewise, Cheung (2002) evaluates information quality based on accuracy, content, format and timeliness. Based on the aforementioned literature, the following hypothesis is proposed: *H4 – Increased information quality positively affects the intention to use Internet banking services in Bahrain*.

3.4.5 Perceived Risks and Benefits Towards the Use of Internet Banking

The fifth construct that may affect the intention to use Internet banking is given by the perceived risks and benefits. The typical characteristics of technology considered in technology adoption studies are based on the assumption of Roger's diffusion of innovation (Rogers, 2003), which include relative advantages (perceived benefits) and relative disadvantages (perceived risks). Before deciding to adopt the technology, the individual may want to weigh risks and benefits in which electronic banking services will not be an exception to this general rule. A larger perception of risk will reduce the perceived benefit of the technology (Horst, Kuttschreuter and Gutteling, 2007).

Theoretical and empirical evidence show that there exists a significant association between perceived risks and benefits and the intention to use Internet banking services. The degrees of risk that customers perceive and their own tolerance of risk taking are factors that influence their purchase decision

(Nasri, 2011). Customers are often worried that a breakdown in the system servers will occur while conducting electronic services, because these situations may result in unexpected losses (Kuisma et al., 2007). Littler and Melanthiou (2006) noted that a breakdown in the system could reduce customers' willingness to use online banking. Based on the aforementioned literature, the following hypothesis is proposed: *H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain.*

3.5 Cultural Dimensions and their Relationship to Technology Acceptance and the Adoption of Internet Banking

The literature reviewed in Chapter 2 revealed that there is a need to carry out an investigation into additional cultural factors that account for technology adoption (Baker et al., 2010; Lee et al., 2013; Gupta, 2012). These studies showed contrasting findings on the cultural impact of technology adoption using Hofstede's cultural dimensions. Undoubtedly, these studies provide insights for understanding technology acceptance in general, but they did not shed light on the uses of a specific technology. So, the sixth construct refers to cultural dimensions and its relationship to technology acceptance and the adoption of Internet banking.

There are theoretical and empirical evidences that establish that there exists a significant association between cultural dimensions and the intention to use Internet banking services. For instance Al-Smadi (2012) undertook a study to show how cultural dimensions affect the adoption of electronic banking services. The result of the study revealed that uncertainty avoidance has a positive and significant impact on perceived ease of use and perceived usefulness. Perceived risk has a stronger impact on customers' attitude, which in turn influences customers' intention to use Internet banking services.

In the same manner, Durfee et al. (2006) found that the cultural dimensions affected instant message usage within Mexico and the United States. The findings of Srite and Karahanna (2006) showed that social influence had a stronger influence on intention to adopt IT in high power distance, uncertainty avoidance and masculine cultures. Likewise, Akour et al. (2006) found that power distance and collectivism impacted significantly and positively, whilst uncertainty avoidance and femininity had no impact at all. On the other hand, Zakour (2007) found that high power distance cultures are less accepting of IT than those from low power distance cultures. Masculine cultures are more established for IT usage, because the use of IT is associated with accomplishing their goals. Li et al. (2009) found that individualism and time orientation influences perceived ease of use (PEOU) and perceived usefulness (PU), directly.

Similarly, Sanna et al. (2010) compared the effects of cultural distance and

country characteristics on the diffusion process and the penetration level on the adoption of wireless communications and using penetration data from 64 countries. The results of their study showed that there was a relationship between the adoption timing and cultural characteristics. Moreover, the findings revealed that the masculinity dimension of culture has no effect on the diffusion of wireless communications. By synthesising the aforementioned literature and studies, Hofstede's values represent "the deepest level of a culture". Based on these ideas, the following hypothesis was proposed: *H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain.*

3.6 Biometrics Technology towards the Use of Internet Banking

According to Sarma and Singh (2010), one of the most important risks in Internet banking is transaction risk. This risk emanates from fraud, error and inability to deliver products and services. To eliminate and avoid this kind of risk, banks have to apply a variety of technologies to ensure the security of transactions. At this point, biometric technology plays an important role, which is usually applied for authentication, which is the seventh construct that may affect the intention to use Internet banking services. The following unique advantages of biometrics are as follows:

First, biometrics can be used to identify an individual based on his/her unique

characteristics. Second, it holds the promise of fast, easy-to-use, accurate, reliable and less expensive authentication for a variety of applications. Third, biometrics is a ‘user-friendly’ system. It boasts of a quick and easy process such as having a picture taken by a video camera, speaking into a microphone or touching a fingerprint scanner. Thus, dealing with multiple levels of authentication or multiple instances of authentication will become less of a burden for users.

Biometric technology is also one of the most important technologies for risk management as well as the security factors of Internet banking. The biometric technology is applied in case of authentication, as a way to verify the buyer’s identity before payments are made (Sarma and Singh, 2010).

Biometrics is the science of the measurement of unique human characteristics, both physical and behavioural. Various biometric technologies are available for identifying or verifying an individual by measuring fingerprint, hand, face, signature, voice or a combination of these traits (IEEE, 2015). Such solutions help protect personal information and financial data from identity theft and fraud. Today, the majority of banks in Bahrain are using biometric access control to have better control over staff attendance and punctuality.

Accenture.com (2014) revealed that by using biometrics, it is possible to confirm an individual’s identity based on “who they are”, rather than by documentation (“what they have”) or passwords (“what they know”). The combination of these

factors makes it possible to gain higher levels of security. A biometric solution will always involve at least one, and often all three, of the following processes:

The first process is the enrolment, which includes the capture and storage of the biometric samples, against which all subsequent identity comparisons will be performed. The next process is verification, which includes the validation of a person's claimed identity, through a one-to-one comparison between the "live" captured biometric data and the corresponding biometric samples data acquired in the enrolment phase; this stage is also known as authentication. The last process which is also needed is the identification. This process includes the determination of an individual's identity through a one-to-many comparison of a "live" captured biometric sample against the entire enrolment database, without the subject having to claim an identity. These "samples" are captured as digital images which are converted to "templates" then stored by a system at any of the above stages, depending on its design. It is generally accepted that biometric traits cannot be easily transferred between people, and thereby represent a highly secure unique identifier (Accenture.com, 2014).

Fatima (2011) pointed out that while biometric sensors continue to become less expensive and smaller in size, the negative perception of biometrics as an encroachment on individual privacy continues to decline. The reason for this is that this technology is likely to be used in almost every transaction needing

authentication of personal identities. Moreover, biometrics is actually an effective strategy for protection of privacy and detection of fraud.

There are new approaches to biometric technologies, like for instance, the thermal pattern created by the blood vessel structure of a person's face, the pattern of veins and arteries on the back side of the hand and palm print. However, the cost of the biometrics systems is an important factor to be considered. Additionally, biometric technologies requiring very little cooperation/participation from users (e.g. face and thermograms) may be perceived as more convenient to users. Based on these ideas, the following hypothesis is proposed: *H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain.*

Consistent with the objectives of the study stated in Chapter 1, the seven hypotheses are summarised as follows:

H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain.

H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain.

H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain.

H4 – Increased information quality reduces the barrier of perceived ease of use

which positively affects the intention to use Internet banking services in Bahrain.

H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain.

H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain.

H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain.

The seven hypotheses were derived from the conceptual model based on the variables of the study. The constructs of perceived privacy protection, perceived security protection and perceived trust, which may positively affect the intention of customers to use internet banking, answer the research question: “From the perspectives of the respondents, what are the influencing factors that may lead to the intention to use and use of internet banking?” On the other hand, the constructs of perceived information quality and perceived risks benefits that may also positively affect the intention of customers to use Internet banking answer the question: “From the perspectives of the respondents, what are the possible risks and benefits towards the intention and use of Internet banking?” The two additional constructs were included – cultural dimensions and biometric technology – which may positively affect the intention of customers to use internet banking, which answers the research question: “What biometric technology may be considered so as to increase the intention to use Internet

banking among bank customers?" and "What cultural dimensions may directly affect the intention to use Internet banking?"

Figure 3.1 presents the initial conceptual model while Table 3.1 describes the constructs and their hypothesised relationship.

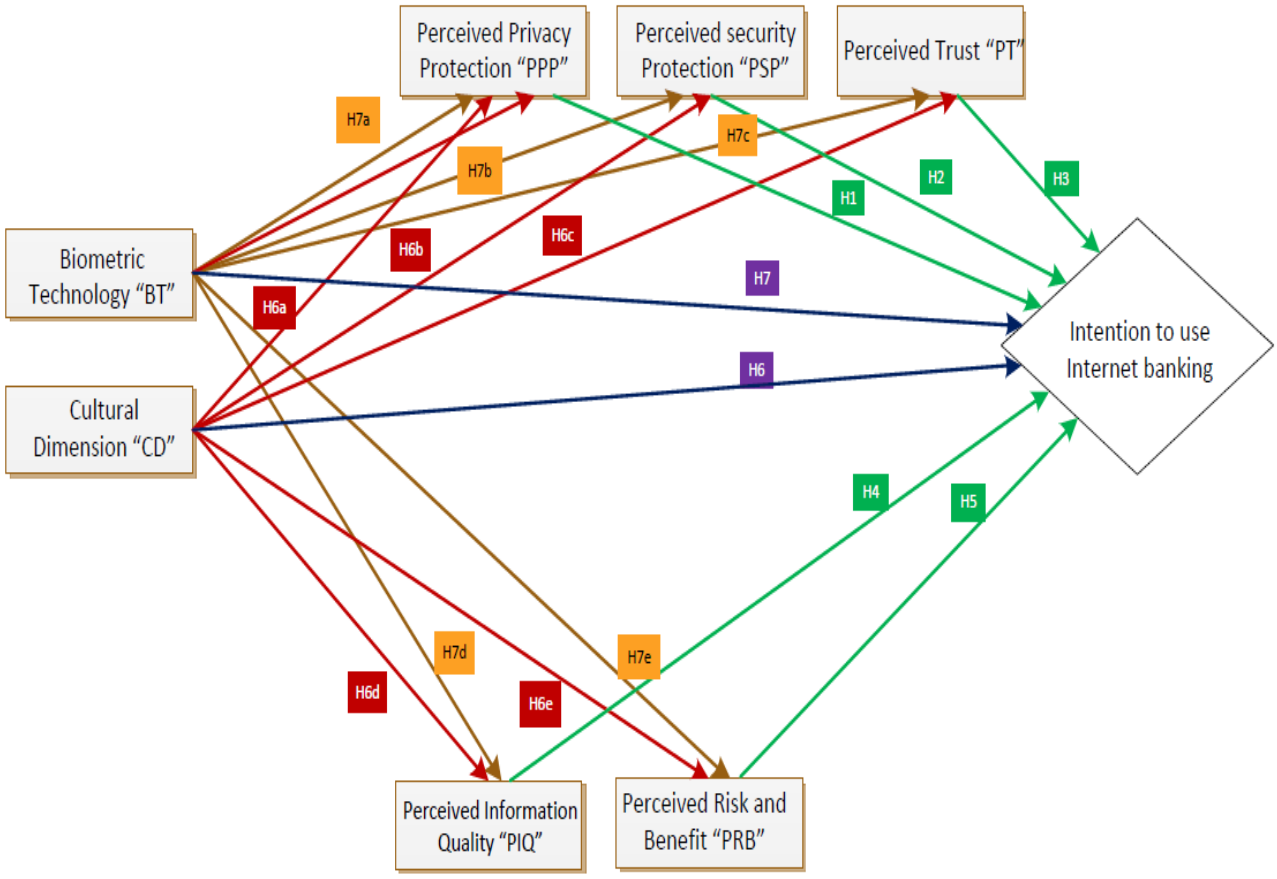

Figure 3.1 Initial (Pre) Conceptual Model (Developed by the Researcher)

Table 3.1 Constructs, Codes, Definitions and Hypothesised Relationship

Constructs	Codes	Definitions	Hypothesised Relationship
Perceived privacy protection	PPP	Perceived privacy protection is the extent to which the users have the assurance the Internet banking website is safe and protects the customers' information.	PPP ⟶ IB
Perceived security protection	PSP	Perceived security protection is the extent to which the users have confidence in the confidentiality of their personal information and security of their finances.	PSP ⟶ IB
Perceived trust	PT	Perceived trust is the extent to which the customer believes that Internet banking is safe and has no privacy threats.	PT⟶ IB
Perceived information quality	PIQ	Perceived information quality is the extent to which users perceive the relevant depth, scope and completeness of information that can affect bank services and	PIQ ⟶IB

		trustworthiness.	
Perceived risks and benefits	PRB	This term refers to the perceptions of users, which include the relative advantages (perceived benefits) and relative disadvantages (perceived risks), of using Internet banking services.	PRB ⟶ AIB
Cultural dimensions	CD	This term refers to cultural impact of technology adoption, particularly the online banking services using Hofstede's cultural dimensions.	CD ⟶ IB
Biometrics technology	BT	Refers to an important technology for risk management as well as security factors of Internet banking to ensure the security of transactions.	BT ⟶ IB
Behavioural intention	BI	The behavioural intention (BI) is defined as a person's perceived likelihood or "subjective probability that he or she will engage in a given behaviour" – in this study, the intention to use Internet banking ervices.	Dependent variable

3.7 Summary

This chapter has discussed the conceptual framework of the study which explains the key variables and the relationships in which seven hypotheses emerged for testing. Five variables were initially chosen that may affect customers in the adoption of Internet banking, namely, perceived privacy protection, perceived security protection, perceived trust, perceived information quality and perceived risks/benefits. Two more variables were included: cultural dimension and biometric technology to measure a significant relationship with any of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain. Consistent with the aim and objectives of the study, the seven hypotheses were summarised as follows: H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain; H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain; H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain; H4 – Increased information quality reduces the barrier of perceived ease of use which positively affects the intention to use Internet banking services in Bahrain; H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain; H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain; H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain. The

next chapter will discuss the research methodology that will explain the overall picture of a quantitative method of research.

4.0 CHAPTER 4

4.1 Methodology

The previous chapter discussed the literature review which highlights the importance of the present investigation. In this chapter the research methodology is explained by describing an overall picture of a quantitative method of research which includes the following topics: Objectives and Research Questions, Research Approach, Methods Used to Collect Data, Research Instruments, Validation of the Research Instrument, Reliability and Validity, Normality of Data, Target Population, Sampling Method, Context, Data Analysis, Descriptive Analysis, Structural Equation Modelling (SEM), Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA).

4.2 Research Approach

The deductive and inductive approaches are the two research approaches widely used by researchers (Saunders et al., 2012); however, this study focuses more on the deductive approach which is relevant to the present investigation. The main reason why this approach was considered is that “the deductive approach starts with a general view of a situation and ends with a view of particular situations”. This approach involves hypotheses testing and the verification and confirmation of the concept or otherwise. In the deductive process, the hypotheses enable the testing of two or more concepts and then explain the

relationship between the concepts using the outcomes of the tests (Gray, 2014). To understand more of this approach, Table 4.1 provides shows the various attributes of the deductive process.

Table 4.1 Attributes of Deductive Approach (Gray, 2014)

Stage in the Deduction Process	Action Taken
Organisational mission	Read and take into account.
Theory	Select a theory or set of theories most appropriate to the subject under investigation.
Hypothesis	Produce hypothesis (a testable proposition about the relationship between two or more concepts).
Operationalise	Specify what the researcher must do to measure a concept.
Testing by corporation or attempted falsification	Compare observable data with a theory – if corroborated, the theory is assumed to have been established.
Examine outcomes	Accept or reject the hypothesis from the outcomes.
Modify theory (if necessary)	Modify theory if the hypothesis is rejected.

As presented in the above table, deduction involves a number of steps including selection of a theory, developing hypotheses, operationalising the hypotheses, testing the hypotheses by corroboration or falsification, analysing the outcomes and modifying theory.

4.3 Design of the Study

The research design helps a researcher to draw boundaries for the research, which consists of defining study settings, type of investigations that needs to be carried out, the unit of analysis and other issues related to the research. A research design is a plan of the research project to investigate and obtain answers to research questions (Cooper and Schindler, 2001).

In this study, the application of descriptive research was used in describing the demographic profiles of the respondents with the use of descriptive statistics like frequencies, percentages, mean and standard deviation of the constructs used. Descriptive research is used to describe characteristics of a population or phenomenon being studied (Kriponant, 2006). The exploratory research was also employed during the first stage of the research in order to obtain the background information about the research problem and to generate hypotheses by carrying out a thorough investigation of the literature. As a quantitative method of research, the study focuses on assessing the co-variation among naturally occurring variables with the goal of identifying predictive relationships by using

correlations or more sophisticated statistical techniques (Waters, 2014). Correlation study attempts to establish cause and effect relationships between the variables using correlation, regression and path analysis in line with the efforts of arguments found in the literature (Kriponant, 2006). This study initially identified the research problem and justified its selection in order to look into valid alternative designs that could have been used. The researcher undertook the review and synthesised previously published literature associated with the adoption of Internet banking. Hypothesis testing has been used as the method to understand the relationship between two variables and verify the independence of two or more factors in a situation. Lastly, the data analysis describes the methods of analysis to be applied to the data in determining whether or not the hypotheses are true or false. Figure 4.1 presents the research design of the study.

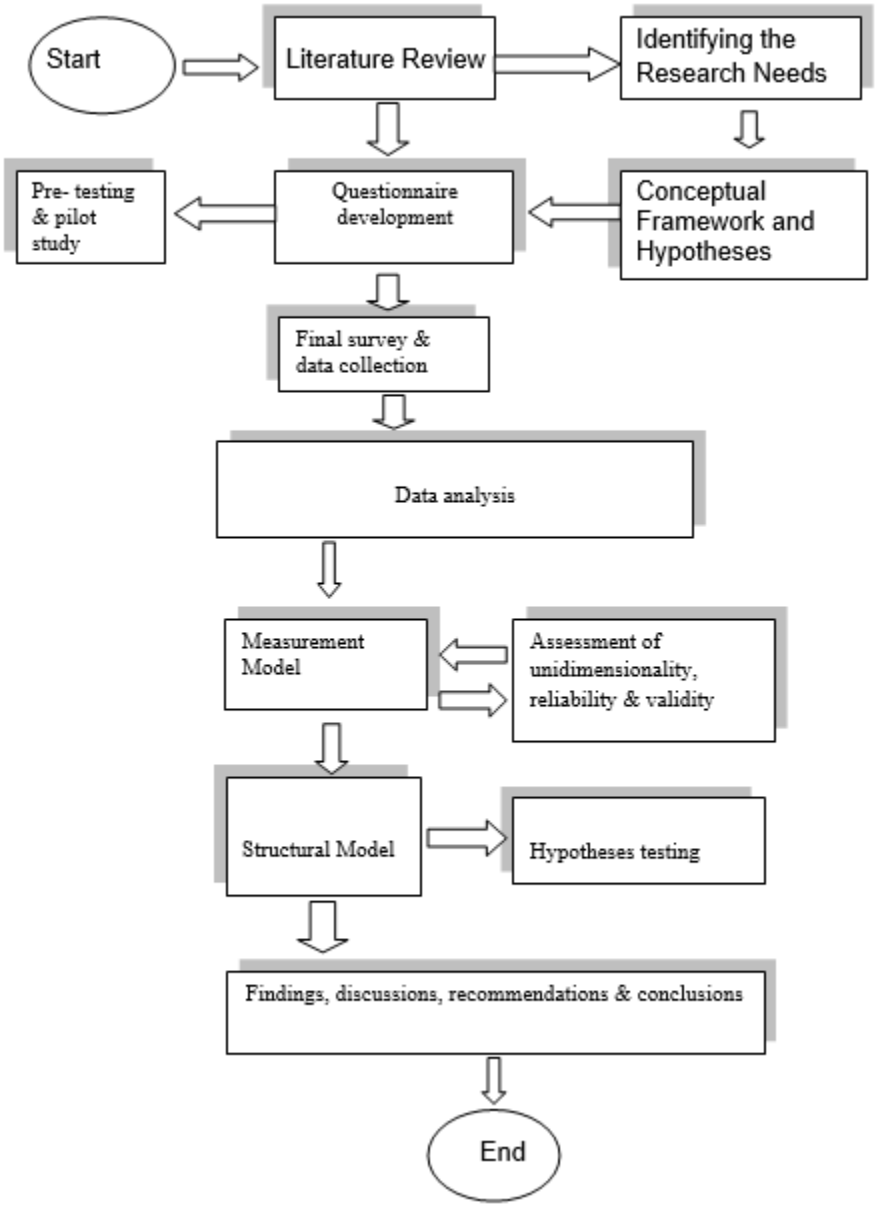

Figure 4.1 Research Design (Adapted from Chandio, 2011)

4.4 Methods Used to Collect Data

In this study, the survey questionnaire was used to collect primary data for the study. Primary data are “new data collected for the purpose and the problem solving of present research” (Saunders et al., 2007:36). The primary data can be gathered through surveys, interviews and observations. There is no chance to clarify questions, probe for more adequate answers or control the conditions under which the questionnaire is filled out. This method is generally considered the best technique in collecting data from a large group of respondents over a short period of time. In this study, questionnaires were distributed to 330 customers of local, regional and international banks. A local bank is a bank that operates within the local area and is primarily owned or controlled by people who live within or near that area. A regional bank is one that operates within that state and a few other states and is owned and/or controlled by people based in those states. On the other hand, international banks refer to those banks focusing on cross-border lending from head offices in developed countries to banks and the non-bank sector in emerging markets (McCauley et al., 2010). Some internationally active banks operate under centralised liquidity management, capital structure and lending activities. Others operate in a more decentralised manner (e.g. HSBC) and like local banks they respond more to domestic than to international developments. They also seem to collect more local currency deposits and provide more local currency lending, so that they might be less liable to sudden stops in cross-border lending. In fact, some emerging market

regulators and central banks do not see much difference between decentralised international and local banks.

The questionnaires were administered to the customers, as the survey aimed to include a broad range of participants characterised by different professions, ages and educational backgrounds. After the questionnaire was developed, a pilot study was conducted using 35 bank customers from local banks who were not part of the actual survey. The pilot testing had two main aims: first, to clarify and improve the questions, and second, to test respondents' comprehension and the clarity of the questionnaire before the actual survey was administered.

Before the actual survey, the researcher wrote a letter to each bank, addressed to their HR department, to facilitate the questionnaire distribution. After seeking the approval of said banks, the researcher distributed the questionnaire in the banking hall of the subject banks. It was agreed that the names of the three banks will not be mentioned in the research for confidentiality purposes. The required sample size depends upon a variety of factors, including whether the intent of the survey is to simply describe population characteristics or to test for differences in certain attributes of interest by sub-groups within the population (Draugalis et al., 2008, p.13).

4.5 Research Instruments

The use of the questionnaires offers an objective means of collecting information about people's knowledge, beliefs, attitudes and behaviour (Flicker et al., 2010). The questionnaire was designed according to the objectives of the survey. In this research the use of a survey questionnaire, which is commonly associated with the deductive research approach and quantitative research method, enabled the researcher to obtain a large amount of data from a fairly sample population in a cost-effective manner. In this research, the questionnaire was administered personally by the researcher which was used to assess the various subjects under investigation. As stated earlier, the writer asked the permission of the HR personnel to distribute the questionnaire, since it is proper to seek approval from them before the actual survey begins.

To ensure that this research complies with relevant regulatory and ethical standards, ethical approval was sought from the university Research Ethics Committee before the actual data collection. The four key ethical rules considered were: the veracity or the truthfulness or absence of deception; privacy or the freedom from unwarranted public intrusion; confidentiality or non-disclosure and fidelity or the accuracy in recording and reporting data.

The writer sought ethical approval which covers the following important factors: consent and information from the participants; any physical or mental risks to the

participants, and the mitigation of those risks; and any risk to other researchers on the project and their mitigation.

4.5.1 Questionnaire Development

One of the benefits of developing a valid and reliable questionnaire is that it can reduce measurement error, which is the discrepancy between respondents' attributes, and their survey responses (Radhakrishna, 2007). In this study, the researcher adopted some items from the questionnaires developed by other authors including Belanger et al. (2002), Kim et al. (2008), Sharma and Singh (2010), and Hofstede (1980), and integrated them into the final questionnaire. Moreover, the theories related to technology adoption served as a guide in adopting parts of the questionnaire that have already been validated. Specifically, the questionnaire was divided into two sections:

Part I: Measures the demographic variables of age, gender, education and occupation of the participants.

Part II: Consists of items related to factors that might influence Internet banking adoption. This part measures the factors affecting the adoption of Internet banking in terms of perceived privacy protection, perceived security, perceived trust, perceived information quality, perceived risks and benefits, cultural dimensions and biometric technology. The following scales and measures were used:

Table 4.2 Scales and Measures

Scale		Verbal Interpretation	Description
1	1.00-1.49	Strongly agree	Respondent strongly agrees on the factors affecting their Internet banking adoption.
2	1.50-2.49	Agree	Respondent agrees on the factors affecting their Internet banking adoption.
3	2.50-3.49	Undecided	Respondent neither agrees nor disagrees on the factors affecting their Internet banking adoption
4	3.50-4.49	Disagree	Respondent disagrees on the factors affecting their Internet banking adoption.
5	4.50-5.00	Strongly disagree	Respondent strongly disagrees on the factors affecting their Internet banking adoption.

In this study, the respondents were asked to evaluate all the items that led to the adoption or avoidance of Internet banking practices. Generally, the level of agreement or disagreement of the selected respondents was measured by using Likert's scaling method based on either positive or negative reaction. In this study, the Likert-type or frequency scales were used to measure the attitudes or opinions of the respondents towards Internet banking adoption. This type of scale assumes that the strength/intensity of experience is linear from strongly agree to strongly disagree. The respondents were offered a choice of five pre-coded responses with the neutral point being neither agree nor disagree (McLeod, 2008).

4.5.2 Validation of the Research Instrument

In order to ascertain the functionality of the questionnaires as instruments of data collection, a pilot survey was undertaken by testing the questionnaire with 35 bank customers and staff in the Kingdom of Bahrain. The pre-testing of the questionnaire helped the researcher in the validation, which means the instrument could measure what it intended to measure. Moreso, the reliability of the research instrument approximates a high degree of closeness between the construct and the information needed on the questions posed on the statement of the problem.

4.5.3 Reliability and Validity of the Research Instrument

The reliability of the research instrument was measured using Cronbach's alpha. Reliability is identified as the similarity of results supplied by independent but comparable measures of the same object, trait or construct (Churchill and Lacobucci, 2002). On the other hand, validity is directed to know the degree of measuring the factors along which they are intended to measure. The alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous (that is, questions with two possible answers) and/or multi-point formatted questionnaires or scales (i.e. rating scale: 1 = poor, 5 = excellent). The higher the score, the more reliable the generated scale is. Nunnaly (1994) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

Accordingly, Cronbach's alpha was computed and the results were compared with the 0.7 level recommended as a cut-off point, which showed that scales were reliable (Nunnally and Bernstein, 1994). However, reliability between 0.5 and 0.6 is considered sufficient. The hypothesised relationships and reliability described in the model were tested using SPSS Amos version 18 software for the type of internal consistency reliability.

4.6 Normality of Data

Assessing data normality is of paramount importance since non-normal distribution of data will affect the overall outcome when hypotheses testing is conducted (Hair et al., 2010). Hence, it is preferable to make a factor analysis to discover the factor loading in the proposed reliable model and find the possible underlying factors. Therefore, this study includes skewness, which is a measure of symmetry, and kurtosis, a measure of whether the data are peaked or flat relative to a normal distribution. According to Hair et al. (2010), normality is indicated when skewness values lie within -2 and 2, and kurtosis values lie within -3 and 3.

4.7 Target Population

In this study, the target population was bank customers from local, regional and international banks (an example of a local bank is the National Bank of Bahrain, a regional bank is the National Bank of Kuwait and an international bank is HSBC or Standard Chartered Bank). These banks currently have a banking operation in the Kingdom of Bahrain and where incorporated under the Central Bank of Bahrain (CBB). One important criterion that determines the selection of respondents is that they should have been bank customers for at least one year, who are using the services of the banks under study.

4.8 Sampling Method

In this study, stratified sampling was used in which the researcher divided the entire target population into different sub-groups or strata from which the final subjects were randomly selected.

First, the participants selected were customers from local, regional and international banks in Bahrain. The identified participants represent a specific sub-group within the population, identified as customers. By choosing the stratified sampling, the presence of key sub-groups within the sample was assured.

During the study, a total of 330 questionnaires were distributed to bank customers of the three selected banks. Only those present during the questionnaire distribution were selected as respondents. The role of sample size is crucial in all statistical analysis. Since this research used structural equation modelling, it required an appropriate sample size in order to obtain reliable estimates (Hair et al., 2006). Sample size depends on model complexity but also on many other factors (e.g. normality of the data, missing patterns). Most researchers would recommend using sample sizes of at least 200/five or ten cases per parameter (Wolf et al., 2013). A very complicated path model needs a sample size of 200 or larger (Kline, 2005) while according to Hair et al. (1998), a sample size of at least 200 and not exceeding 400 is considered appropriate.

Thus, as a general rule, a sample of a minimum of 200 is needed to give parameter estimates with any degree of confidence.

The questionnaires were distributed to the banks under study from the period of May 07, 2015 until May 30, 2015. The writer sought the permission of the HR personnel before questionnaire distribution, of which 200 questionnaires were distributed to a local bank, 80 to a regional bank and 50 to an international bank, with an overall total of 330. These questionnaires were specifically entrusted to the customer service personnel who have direct contact with bank clients. The completed survey questionnaires were retrieved on May 30, 2015. From among the retrieved questionnaires, 30 responses were discarded due to incomplete responses or no answer at all. From the local bank, 180 questionnaires were retrieved out of 200 (or a 90% retrieval rate); 70 out of 80 from the regional bank (or an 87.50% retrieval rate) and 50 out of 50 from an international bank (or a 100% retrieval rate). Overall, only 300 questionnaires were used for data analysis which represented a response rate of 90.9%. Table 10 presents the respondents and percentage of retrieved questionnaires of the study.

Table 4.3 The Respondents of the Study

Sample	Distributed Questionnaires	Retrieved Questionnaires	Percentage of Retrieved Questionnaires
Local bank	200	180	90%
Regional bank	80	70	87.50%
International bank	50	50	100.00%
	330	300	90.9%

4.9 Data Analysis

After finalising the target population, sample size, research instrument and collection of data, the next step was to determine the steps involved in analysing the collected data. The steps involved were data editing, coding and analysing the reliability. In analysing the data, the descriptive statistics used were frequency, percent, median, standard deviation, skewness, kurtosis and Pearson correlation (Kriponant, 2006). Further to testing the convergent validity and computing the descriptive statistics and construct reliability, discriminant validity tests were conducted and structural equation modelling were used to test the research model and verify the hypotheses. In order to conduct the analysis the researcher used the Software Package for Social Sciences (SPSS Amos version

18) which is a commonly used software package for data analysis (Mghoi and Gichuho, 2013).

4.10 Structural Equation Modelling (SEM)

Structural equation modelling is a method by which it is possible to build a more complete picture of a research interest (Abramson et al., 2005). One of the advantages of this method is that what can be done by using multiple regressions and factor analysis individually can be achieved by using SEM. The use of this method helps in identifying a set of independent constructs or variables that explain a particular dependent construct or variable. Exploratory factor analysis enables the researcher to reduce a set of variables to a smaller group of factors that underly undetected by the researcher and identify those variables that load on each factor. Furthermore, the use of SEM provides knowledge on how independent variables contribute to the explanation about the dependent variable. Likewise, SEM can handle several multiple regression equations simultaneously and generate a model using those equations at the same time. An important facility offered by SEM is the possibility to involve moderating and mediating variables if necessary (Byrne, 2001).

4.10.1 Representation of SEM

A normal representation of an SEM is given below.

Dependent Variable (DV) = Independent variable (A) + Independent Variable (B) + Independent Variable (C). This equation can represent the structural model that is given in Figure 4.2 below.

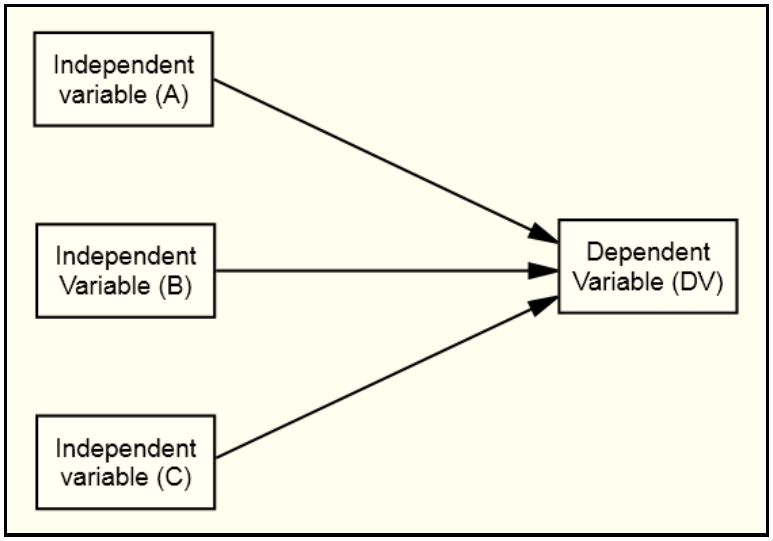

Figure 4.2 SEM Representation of Equation (1)

As for the research model in Figure 3.1, the following structural equations can be formulated based on the following hypotheses:

H1 – Increased privacy protection positively affects the attitude of customers towards the use of Internet banking services in Bahrain.

H2 – Increased security protection positively affects the attitude of customers towards the use of Internet banking services in Bahrain.

H3 – Increased trust of online banking services positively affects the attitude of customers towards the use of Internet banking services in Bahrain.

H4 – Increased information quality reduces the barrier of perceived ease of use which positively affects the attitude of customers towards the use of Internet

banking services in Bahrain.

H5 – Reduced risks and increased benefits of online banking services positively affect the attitude of customers towards the use of Internet banking services in Bahrain.

H6 – Adherence to certain dimensions of culture positively affects the attitude of customers towards the use of Internet banking services in Bahrain.

H7 – Increased usage of biometrics positively affects the attitude of customers towards the use of Internet banking services in Bahrain.

It must be pointed out that SEM is divided into two aspects, namely confirmatory factor analysis and path analysis. Confirmatory factor analysis is used to test what is called a measurement model. A measurement model of SEM is a model that enables the researcher to evaluate the measured or observed variables to know how well the observed variables operate together to generate knowledge on underlying hypothesised constructs (Weston and Gore, 2006). An example of a measurement model is given in Figure 4.3.

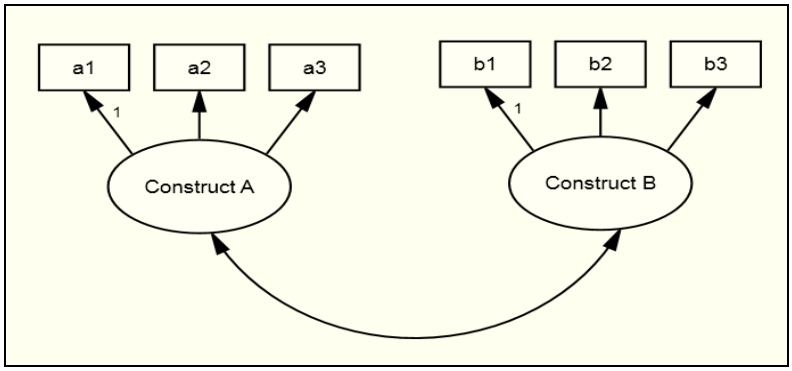

Figure 4.3 Example of Measurement Model

As reflected in Figure 4.3 Construct A and Construct B are called the latent variables. A1, a2, a3, b1, b2 and b3 are called the observed variables. In the language of the measurement model Construct A is represented by measured (observed) variables a1, a2 and a3. Similarly, Construct B is represented by measured (observed) variables b1, b2 and b3. While SEM comprises the measurement model and a structural model, CFA uses the measurement model and structural model. The structural model links the latent variables through a series of recursive and non-recursive relationships (Albright and Park, 2009). An example of the structural model is provided in Figure 4.4.

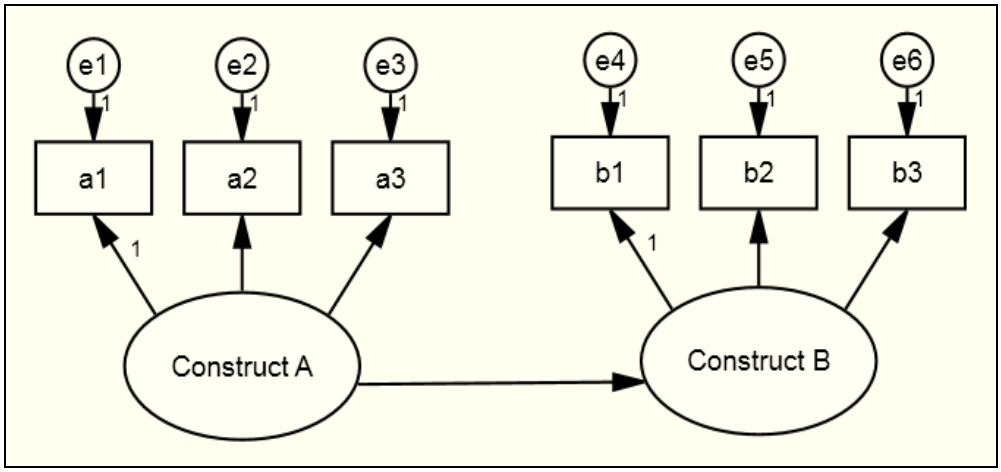

Figure 4.4 Example of the Structural Model

4.10.2 Confirmatory Factor Analysis (CFA)

A confirmatory factor analysis (CFA) was used to identify the causal relationships among observed factors and the fundamental theoretical constructs. In this study AMOS version 18 was used to achieve this analysis. The paths among the

fundamental exogenous and endogenous constructs were classified in the structural model, which is the second stage.

Four tests were used to examine these items of the analysis: unidimensionality, convergent validity, reliability and discriminant validity to achieve the right decisions concerning reliable factors.

Unidimensionality implies that a set of items forming an instrument measuring one thing in common is an important aspect of construct validity. On the other hand, convergent validity is a feature that shows the degree to which two distinct indicators of a given latent variable confirm one another. One of the remarkable conditions in the output is that each of the loadings is significant (all of the CR >1.96); another strict condition is that the correlation between each indicator and the corresponding latent variable >0.50. These two conditions when satisfied indicate a convergent validity of the model.

Reliability should be verified because a model can be reliable without being convergent valid. The reliability is determined on the basis of the "Composite Reliability" or "Construct Reliability" and the "Variance Extracted" that are calculated for each latent variable through the following formulae:

$$Composite\ \mathrm{Re}liability = \frac{(\sum\ s\tan dardized\ \ loadings)^2}{(\sum\ s\tan dardized\ \ loadings)^2 + \sum\ measurement\ errors} \quad (2)$$

Where the measurement error = 1 – (the reliability of the indicator), and the standardised loadings is the square multiple correlation.

$$Variance\ \ Extracted = \frac{\sum (s\tan dardized\ \ loadings)^2}{\sum (s\tan dardized\ \ \ loadings)^2 + \sum measurement\ errors} \quad (3)$$

Confirmatory factor analysis was used in this research to evaluate the measured or observed variables to know how well the observed variables operate together to generate knowledge on underlying hypothesised constructs. However, confirmatory factor analysis requires the researcher to assign variables and the researcher must specify both the number of factors that are underlying within a set of variables and which factor each variable loads highly on before the results can be computed (Hair et al., 2006). Thus, the results depend on the choice of the factors and variables used to measure them by the researcher.

4.10.3 Exploratory Factor Analysis (EFA)

Another type of factor analysis used in this research is the exploratory factor analysis (EFA) which aims to reveal the nature of the factors influencing a set of responses (DeCoster, 1998). This test enables the researcher to identify the number of common factors that influence a set of measures and the degree of relationship between each factor and each observed measure.

There were seven steps involved in EFA which include collection of measurements, working out the correlation matrix, selection of the number of factors for inclusion, extraction of the researcher's initial set of factors, rotation of

the factors to a final solution, interpretation of factor structure and construction of the factor scores for further analysis (DeCoster, 1998).

4.11 Summary

This chapter has discussed the research methodology, research philosophy and approach used and the research design. The research design helped the researcher draw boundaries for the research in order to investigate and obtain answers to research questions. Likewise, it provided an analysis of the empirical methodology discussed in terms of the objectives and research questions, methods used to collect data, research instruments, validation of the research instrument, reliability and validity, normality of data, target population, sampling method, context, data analysis, descriptive analysis and the structural equation modelling. The use of SEM would help in identifying a set of independent constructs or variables that explain a particular dependent construct or variable. Two sets of factor analyses were applied, first, the confirmatory factor analysis (CFA) to identify the causal relationships among observed factors and the fundamental theoretical constructs, and second, the exploratory factor analysis (EFA) which aims to reveal the nature of the factors influencing a set of responses. The next chapter contains the results of the major findings to examine the factors which may affect the adoption of Internet banking in the Kingdom of Bahrain.

5.0 CHAPTER 5

5.1 Data Analysis

The previous chapter dealt with the different aspects of methodology adopted in this study. This chapter discusses the data analysis sourced from the survey questionnaires which are presented, analysed and interpreted. Moreover, the results of the major findings from a quantitative analysis of the uptake of Internet banking in the Kingdom of Bahrain are presented in this section of the research which include: the Demographic Profile of the Respondents, Background Regarding the Use of the Internet, the Factors That Influence Internet Banking Adoption, Security Concerns about Online Services, Security of Devices Used to Access the Internet, Devices Used to Access the Internet, Devices Used to Access the Services on the Internet, Testing the Reliable Model, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Unidimensionality, Standardised Regression Weight, Root Mean Square Error of Approximation (RMSEA), The Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI), Standardised Residual Co-variance, Modified Confirmatory Model, Convergent Validity, Reliability, Discriminant Validity and Path Analysis.

5.2 The Demographic Profile of the Respondents

This part contains the details of the respondents' age, gender, employment sector, education and background regarding the use of and the reasons for using the Internet.

The first section of Table 5.1 presents the demographic profile of the respondents. As presented in the said table, 30% of the respondents were dominated by the 24-34 year-old age group while 25% belong to the 19-23 years of age bracket. Likewise, 19% belonged to the 35-50 age group. This implies that in general, the bank customers were represented by the young professional age group.

With respect to the genders of participants, 62% of the respondents were males while 38% were females. This implies that the majority of the bank customers were males.

Five employment sectors were provided in which respondents had to identify the employment in which they belong. The results revealed that the respondents were working mostly in the banks as represented by 40% of the total. This implies that there were more male banking customers who participated in the survey. In the same respect, 20% of the bank customers were working in the education sector. The majority (or 62%) of the respondents were employees.

This implies that bank customers are working professionals and have the ability to transact business with the banks and avail of their facilities and services.

In terms of educational attainment, 46% were bachelor's degree holders while 24% were master's degree and 21% were high school graduates. Interestingly, 4% of the bank customers were PhD holders. As indicated, bank customers were highly educated based on their educational attainment.

Table 5.1 Demographic Profiles of Respondents

Age	N	Percent
16-18 years old	40	13%
19-23 years old	74	25%
24-34 years old	91	30%
35-50 years old	58	19%
51-65 years old	24	8%
Over 65 years old	13	4%
Total	**300**	**100%**
Gender		
Male	185	62%
Female	115	38%
Total	**300**	**100%**
Employment: What sector do you work in?		

Education	61	20%
Manufacturing	28	9%
Banking services	121	40%
Financial	50	17%
Others, please specify	40	13%
Total	**300**	**100%**
Position/Title		
Sales manager	28	9%
Salesperson	10	3%
Primary school teacher	35	12%
Employee	187	62%
Others, please specify	40	13%
Total	**300**	**100%**
Education:		
Left school at 16	1	0%
High school diploma	62	21%
Bachelor’s degree	139	46%
Master’s degree	73	24%
PhD	12	4%
Others, please specify	13	4%
Total	**300**	**100%**

5.3 Background Regarding the Use of the Internet

Table 5.2 presents the background regarding the use of the Internet. As revealed, 48% of the participants imparted that they use the Internet several times a day or very often. Another group said they use the Internet often, once a day, as represented by 27% of the respondents. Fifteen percent said they use the Internet quite often or several times a week but not every day. Only 4% said they did not use the Internet very often or several times a month. This finding implies that, in general, bank customers are heavy users of the Internet since most of them use it several times a day.

When asked about the reasons why they used the Internet almost half (or 49%) of the respondents said they want to “keep in touch with friends and relatives (social media/Facebook)”. However, 16% said they want to search for information. Interestingly, a meagre 12% said they use it for banking services. The other 3% use it for government services. Internet banking or online banking allows customers to access information about products and services and conduct financial transactions on a secure website operated by their bank. Internet banking services (IBS) include monitoring accounts, paying bills and transferring money between bank accounts.

Table 5.2 Background Regarding the Use of the Internet

Background regarding use of the Internet		
How often do you use the Internet?		
Very often (several times a day)	145	48%
Often (once a day)	80	27%
Quite often (several times a week but not every day)	45	15%
Not very often (several times a month)	12	4%
Not often (several times a year)	8	3%
Not at all	10	3%
	300	**100%**
Reasons why you use the Internet:		
Searching for information	48	16%
Entertainment (movies and games)	16	5%
Keeping in touch with friends and relatives (social media/Facebook)	146	49%
News	25	8%
For work	6	2%

Shopping	10	3%
Banking	37	12%
For government services	8	3%
Other (please state)	4	1%
	300	**100%**

5.4 The Factors That Influence Internet Banking Adoption

In this section, the factors that influence Internet banking adoption are presented, which include privacy concerns about online services, security of online services and security of online devices.

5.4.1 Privacy Concerns About Online Services

Eight items were provided in this dimension to measure the perceptions of respondents with respect to privacy concerns about online services based on the five-point Likert's scaling method ranging from "strongly agree" to "strongly disagree". As presented in Table 5.3 the respondents answered negatively on three listed statements: "Keeping in touch with friends and relatives", 4.06, interpreted as "disagree", "work", 4.41 and "banking", 4.20, all interpreted as "disagree". These findings imply that the respondents are concerned about their privacy when dealing with social, banking and work activities. However, the participants agreed that they have no concerns about privacy when carrying out online activities for entertainment (movies and games), 2.23; news, 1.66;

education, 2.4. Interestingly, the respondents answered “neither agree” nor “disagree” on privacy issues when doing work or shopping with means of 4.41 and 4.29 respectively. Privacy concerns are identified as one of the main factors that have a negative impact on Internet users’ online behaviour. Most often, Internet users do not have confidence that a website will ensure their privacy, either in collection of, or in future usage of, their personal information. In this section, the researcher shows the categorical statement of privacy factors that can influence users’ privacy perceptions during their online activity.

Table 5.3 Privacy Concerns about Online Services

Privacy Concerns About Online Services	1	2	3	4	5	Mean	Description
1. Searching for information on the Internet	0.51	0.9	0.20	0.17	0.15	1.93	Agree
2. Entertainment (movies and games)	0.42	0.6	0.09	0.49	0.62	2.23	Agree
3. Keeping in touch with friends and relatives	0.06	0.1	0.32	1.16	2.38	4.06	Disagree
4. News	0.54	0.7	0.19	0.12	0.13	1.66	Agree
5. For work	0.02	0.1	0.11	1.24	2.95	4.41	Disagree
6. Shopping	0.04	0.1	0.12	1.55	2.52	4.29	

							Disagree
7. Banking	0.06	0.1	0.22	1.35	2.52	4.20	Disagree
8. For government services	0.29	0.5	0.45	0.65	0.82	2.67	Undecided
9. For education	0.38	0.4	0.51	0.43	0.7	2.43	Agree

Legend:

1.00–1.49 Strongy Agree (SA)
1.50–2.49 Agree (A)
2.50–3.49 Undecided (U)
3.50–4.49 Disagree (DA)
4.50–5.00 Strongly Disagree (SD)

5.4.2 Security Concerns About Online Services

Eight items were provided in this dimension to measure the perceptions of respondents with respect to security concerns based on the five-point Likert scale ranging from “strongly agree” to “strongly disagree”. Table 5.4 presents the security concerns about online services. When asked about security of online services, the participants responded in different ways. The respondents “disagree” on the following statements: Keeping in touch with friends and relatives, 4.04; for work, 4.35; Shopping, 4.21; and Banking, 4.23 which imply that security for these online activities is important. This implies that the respondents took into consideration the security of transactions of these online services. However, they agreed on the following: Entertainment (movies and games), 2.35; News, 1.73; and Education, 2.31. This means the respondents did not give too much consideration to security matters of the aforementioned

activities. In contrast, the respondents neither agreed nor disagreed or were undecided on the item: Government services, with a mean average of 3.40. Generally, the findings imply that certain activities on the Internet must be kept secure, especially banking services.

Extant literature mentioned that security is a major concern that contributes to an individual's desire to adopt online services. However, due to some security issues, ranging from privacy disclosure to financial loss, individuals whose willingness to apply online services may be lessened (Chorng-Shyong Ong, 2015). Concerns about security and privacy were identified by McCloskey (2006) as barriers to the use of electronic innovations, while Zhao et al. (2010:8) argued that data security is a major issue for businesses, public bodies and consumers. These findings were supported by Chang and Ho (2006, p.346) who recommended setting a tight security policy on the Internet so as to minimise organisational risk. Likewise, Hong et al. (2003) pointed out that the goal of information security is to ensure the confidentiality of information within the system, and to provide methods for establishing and maintaining the integrity of information as well as the availability of information processing resources.

Table 5.4 Security Concerns about Online Services

Security Concerns About Online Services	1	2	3	4	5	Mean	Description
1. Serching for information on the Internet	0.58	0.9	0.23	0.25	0.29	2.25	Agree
2. Entertainment, movies and games	0.39	0.6	0.15	0.56	0.68	2.35	Agree
3. Keeping in touch with friends and relatives	0.04	0.1	0.48	1.2	2.2	4.04	Disagree
4. News	0.55	0.6	0.23	0.17	0.2	1.74	Agree
5. For work	0.03	0.1	0.16	1.16	2.9	4.35	Disagree
6. Shopping	0.04	0.1	0.18	1.45	2.43	4.21	Disagree
7. Banking	0.05	0.1	0.22	1.36	2.55	4.23	Disagree
8. For government services	0.17	0.3	0.36	1.07	1.53	3.40	Undecided
9. For education	0.38	0.5	0.49	0.37	0.57	2.31	Agree

5.4.3 Security of Devices Used to Access the Internet

Five items were presented to establish the perceptions of the respondents about the security of devices used to acces the Internet on a five-point Likert scale ranging from “Very secure” to “Not always secure”. Table 5.5 presents the security of devices used to access the Internet. The respondents have

manifested the following perceptions: Mobile phone, 3.90, not very secure; Smart phone, 2.03, secure; Computer, 2.18, secure; Laptop, 2.18, secure; Tablet/PDA, 1.81, secure. These findings imply that all devices are perceived to be “secure” except mobile phones.

The demand for mobile applications that incorporate transactional features coincides with the rapid growth in the use of smart phones and sophisticated mobile devices. Entrust.com (2014) pointed out that there are noted barriers to mobile applications which include infrastructure and business issues. Likewise, notably among these issues is the overriding concern about security. In fact, organisations give weight to this problem in their marketing messages. Regardless of whether an organisation has experience in deploying transactions via mobile applications, authentication is seen as a prime challenge to resolving security issues.

When it comes to security, most mobile devices are a target waiting to be attacked. This is the conclusion of a report to Congress on the status of the security of mobile devices watchdogs at the Government Accountability Office (GAO) of the US (Cooney, 2012). The GAO indicated that: “Mobile devices face an array of threats that take advantage of numerous vulnerabilities which can be the result of inadequate technical controls, but they can also result from the poor security practices of consumers” (Cooney, 2012).

Table 5.5 Security of Devices Used to Access the Internet

Devices Used to Access the Internet	1	2	3	4	5		Description
1. Mobile phone	0.06	0.1	0.61	1.17	1.95	3.90	Not very secure
2. Smart phone	0.52	0.4	0.27	0.36	0.47	2.03	Secure
3. Computer	0.41	0.5	0.57	0.24	0.47	2.18	Secure
4. Laptop	0.39	0.6	0.58	0.35	0.22	2.11	Secure
5. Tablet/PDA	0.5	0.6	0.26	0.2	0.2	1.81	Secure

5.5 Devices Used to Access the Internet

Five items were presented to establish the perceptions of the respondents on "which devices they use to access the Internet" on a five-point Likert scale ranging from "Always" to "Never". Table 5.6 presents the devices used to access the Internet with the following responses: Smart phone, 1.80; Computer, 2.39; Tablet/PDA, 2.65, interpreted as "Very often". They also used laptops, 2.65,

often. However, they do not use mobile phones very often. This implies that the participants are using smart phones, computers, tablets and PDAs very often when accessing services on the Internet. The participants are least likely to use mobile phones because of the vulnerability attached to them.

Table 5.6 Devices Used to Access the Internet

Devices used to access Internet	1	2	3	4	5	Mean	Description
1. Mobile phone	0.06	0.1	0.53	1.31	1.87	3.89	Not very often
2. Smart phone	0.51	0.6	0.36	0.16	0.18	1.80	Very often
3. Computer	0.33	0.5	0.53	0.44	0.55	2.39	Very often
4. Laptop	0.25	0.5	0.6	0.77	0.52	2.65	Often
5. Tablet/PDA	0.46	0.7	0.34	0.23	0.17	1.87	Very often

5.6 Devices Used to Access Services on the Internet

Nine items were presented to establish the perceptions of the respondents on the devices they use to access the services on the Internet using a five-point Likert scale ranging from “Always” to “Never”. As revealed in Table 5.7, the respondents revealed that when searching for information, social media and

news, they always use a computer/laptop with a mean score from 1.43 to 1.46. When accessing banking services, they also use the same technological gizmos, 1.59, interpreted as “very often”. However, they use mobile phones and iPads when accessing social media and news, interestingly, in terms of banking services, the respondents use a computer/laptop and tablet/iPad, “very often”. These findings suggest that from the respondent’s point of view, computers and laptops, tablets and iPads are much easier and accessible to use when accessing services on the World Wide Web. However, respondents are least likely to use mobile phones for banking services because of the vulnerability attached to them.

It is noteworthy that Internet users prefer to use computers or laptops because of their overriding concern about Internet security of which authentication is seen as a prime challenge to resolving these issues (Entrust.com, 2014). This idea was supported by Al Soufi et al.’s (2013) study of Internet banking services in Bahrain which revealed that more than 45% of non-users have the perception that this type of service is not safe. In addition, another reason for not using these services was that Internet banking websites were notably lacking in the area of customer understanding and did not provide options for customers to customise their preferences, quick links and login landing option.

Table 5.7 Devices Used to Access Services on the Internet

Service type	Computer/Laptop	Description	Mobile phone	Description	Tablet/iPad	Description
1. Searching for information	1.45	Always	3.12	Often	2.54	Often
2. Watching movies/playing games	2.57	Often	3.26	Often	2.29	Very often
3. Social media (Facebook/ Twitter)	1.43	Always	1.70	Very often	1.44	Always
4. News	2.54	Often	4.77	Never	1.46	Always
5. Shopping	1.6	Very often	5.00	Never	3.38	Often
6. Banking	1.59	Very often	5.00	Never	2.37	Very often
7. Education services	3.2	Often	5.00	Never	3.11	Often
8. Work services	2.37	Very often	5.00	Never	3.02	Often
9. Government services	3.57	Not very often	5.00	Never	0.56	Often

5.7 Perception of Respondents of Factors Affecting the Adoption of Internet Banking

This part measures the factors affecting the adoption of Internet banking in terms of perceived privacy protection (PPP), perceived security (PS), perceived trust

(PT), perceived information quality (PIQ), perceived risks and benefits (PRB), cultural dimensions (CD) and biometric technology (BT).

5.7.1 Perceived Privacy Protection (PPP)

Table 5.8 presents the perceived privacy protection from the perspectives of the respondents. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” to “strongly disagree”. Nine items were used to measure this construct.

As presented, it could be noted that the lowest mean was reflected on the item “too much personal information is being collected when I use online banking”, with a mean of 1.33 and interpreted as “strongly agree”. Other items that were taken as issues on privacy were “agreed” upon by the respondents: “The personal information held by my bank is not shared with other organisations without my consent”, 1.97; “The personal information held by my bank is stored and used according to legal or regulatory requirements only”, 2.05; “Overall, I am confident that my personal information held by my bank is kept private”, 1.96; “When I use online banking I am concerned about the privacy of my personal information”, 1.64; “Unauthorised persons (i.e. hackers) have access to my personal information when I use online banking”, 2.08. All the aforementioned items were agreed upon by the respondents. However, the respondents were “undecided” on the items: “My bank keeps all my personal information

confidential", 2.78; and "The personal information held by my bank is used only for improving the accuracy of the services they provide me", 2.58. The findings revealed that respondents were concerned about how their personal information is collected when using online banking activities.

Extant literature revealed that the single greatest factor influencing online purchase behaviour is a concern over control of private information. Likewise, it can be assumed that conducting banking transactions online will raise similar questions about privacy risks (Pope and Lowen, 2009; McCole et al., 2010). According to Pavlov (2011), with the use of the Internet, consumers show great concerns about how personal information is so easily collected, stored, processed and utilised. Sometimes, there are actually customers of firms that collect personal information for dubious purposes which has led consumers to become deeply interested in the topic of information privacy.

One of the reasons why online customers avoid performing online financial transactions is the threat of information privacy which pushes them away from providing personal and sensitive information (Wang et al., 2003). From a privacy standpoint, trust can be viewed as the customer's expectation that an online business will treat the customer's information fairly (Omariba, 2012), and that privacy is the most important determinant of consumer confidence (Mukherjee and Nath, 2007). Thus, any feelings of trust created or developed in the customer's view of the business can ease privacy concerns, which in turn will

promote the sharing of personal information, and facilitate the completion of a transaction (Lee and Cranage, 2011). According to Hong and Thong (2013) online customers felt the release of personal information important in their interaction with websites, however, they had little control over how their information would be managed once released.

Table 5.8 Perceived Privacy Protection

Privacy – Perceived Privacy Protection (PPP) (Kim et al., 2008)	1	2	3	4	5	Mean	Description
1. My bank keeps all my personal information confidential	0.23	0.36	0.86	0.7	0.633	2.78	Undecided
2. The personal information held by my bank is used only for improving the accuracy of the services they provide me	0.32	0.43	0.48	0.7	0.667	2.58	Undecided
3. The personal information held by my bank is not shared with other organisations without my consent	0.52	0.39	0.42	0.3	0.333	1.97	Agree
4. The personal information held by my bank is stored and used according to legal or regulatory requirements only	0.47	0.49	0.39	0.3	0.383	2.05	Agree
5. Overall, I am confident that my personal information held by my bank is kept private	0.44	0.53	0.59	0.3	0.05	1.96	Agree

6. When I use online banking I am concerned about the privacy of my personal information	0.62	0.46	0.25	0.1	0.2	1.64	Agree
7. Unauthorised persons (i.e. hackers) have access to my personal information when I use online banking	0.56	0.33	0.14	0.4	0.667	2.08	Agree
8. I am concerned that too much personal information is being collected when I use online banking	0.74	0.46	0.04	0	0.05	1.33	Strongly agree
9. The information collected when I use online banking will be kept private by my bank	0.26	0.39	0.68	0.5	1.033	2.82	Undecided

5.7.2 Perceived Security Protection (PSP)

Table 5.9 presents the perceived security protection. Ten items were used to measure perceived security protection on which the perception of the respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” to “strongly disagree”. The results revealed that the lowest mean was on the item: “Security features are important to them when choosing Internet banking”, 1.29, strongly agree. All other items were agreed upon by the respondents: “My bank implements security measures to protect me when I use online banking”, 1.89; “My bank provides a secure service when I use Internet banking”, 1.81; “I feel secure when using Internet banking”, 1.69; “I think current password-based authentication for online banking is very secure”, 2.25; “I do not/would not use online banking because it is not secure”, 1.73; “I use online

banking even though I believe it is not secure", 2.41; "My bank usually ensures that transactional information is protected from accidentally being altered or destroyed during a transmission on the Internet", 2.43. These findings imply that security features play a significant factor in the adoption of Internet banking.

Table 5.9 Perceived Security Protection

Security – Perceived security protection	1	2	3	4	5	Mean	Description
1. Security features are important to me when choosing Internet banking	0.73	0.5	0.06	0	0	1.29	Strongly agree
2. My bank implements security measures to protect me when I use online banking	0.53	0.48	0.23	0.5	0.183	1.89	Agree
3. My bank provides a secure service when I use Internet banking	0.57	0.46	0.3	0.1	0.35	1.81	Agree
4. I feel secure when using Internet banking	0.59	0.47	0.26	0.3	0.117	1.69	Agree
5. I use online banking because I believe it is secure	0.62	0.37	0.32	0.2	0.217	1.7	Agree
6. I think current password-based authentication for online banking is very secure	0.37	0.53	0.53	0.5	0.3	2.25	Agree
7. I do not/would not use online banking because it is not secure	0.51	0.67	0.33	0.1	0.15	1.73	Agree
8. I use online banking even though I believe it is not secure	0.35	0.49	0.48	0.5	0.633	2.41	Agree

9. My bank usually ensures that transactional information is protected from accidentally being altered or destroyed during a transmission on the Internet	0.35	0.45	0.51	0.5	0.567	2.43	Agree
10. In general, online banking is riskier than telephone banking	0.39	0.46	0.27	0.4	0.9	2.46	Agree

Legend:

1.00–1.49 – SA
1.50–2.49 – A
2.50–3.49 – U
3.50–4.49 – DA
4.50–5.00 – SD

5.7.3 Perceived Trust (PT)

Another factor considered in Internet banking adoption is the perceived trust of banking services. Table 5.10 presents the perceived trust of banking services. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” to “strongly disagree”. Six items were used to measure this construct.

The highest mean on this dimension was reflected with the statement: “Overall, I trust my bank to provide me with secure online banking services”, 4.09, interpreted as “disagree”. It is notable that five other statements were given “undecided” ratings by the participants: “Overall, I trust my bank to provide me with secure online banking services”, 2.6; “I would never use online banking services because I don’t trust my bank to provide a secure service”, 3.0; “I would never use online banking services because the Internet is not secure”, 2.48.

These findings imply that there was an issue of trust regarding online banking services as perceived by the respondents who answered negatively to the statement: “Overall, I trust my bank to provide me with secure online banking services”.

Table 5.10 Perceived Trust of Banking Services

Trust	1	2	3	4	5	Mean	Description
1. Overall my bank provides an online service that is trustworthy	0.38	0.38	0.33	0.4	1.05	2.57	Undecided
2. I trust my bank to keep its promises and commitments	0.26	0.56	0.6	0.4	0.767	2.62	Undecided
3. I trust my bank to resolve any issues if something goes wrong with my online banking transactions	0.07	0.21	0.16	0.8	2.867	4.09	Disagree
4. Overall I trust my bank to provide me with secure online banking services	0.31	0.5	0.45	0.5	0.85	2.6	Undecided
5. I would never use online banking services because I don’t trust my bank to provide a secure service	0.26	0.32	0.32	0.7	1.417	3.07	Undecided
6. I would never use online banking services because the Internet is not secure	0.31	0.65	0.23	0.6	0.717	2.48	Undecided

5.7.4 Perceived Information Quality (PIQ)

Table 5.11 presents the perceived information quality. The perception of the

respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” to “strongly disagree”. Six items were used to measure this construct.

Four items were agreed upon by the respondents: “The information provided by my bank for online banking is useful”, 2.17; “The information provided by my bank for online banking is reliable”, 2.48’; “The information provided by my bank when I make online transactions is clear”, 2.25; “Overall the information provided by my bank for online banking is of high quality”, 2.19.

However, two statements were given “undecided” remarks by the participants: “The information provided by my bank for online banking is complete”, 2.52; and “My bank provides enough information to convince me that online banking is safe”, 2.95. However, from the respondents’ perspectives they believe “that the information provided by the banks is generally clear, useful and reliable”. These findings imply that the respondents have conflicting ideas about the completeness, reliability and the quality of information provided by the banks under study. By casting doubt on the completeness of information means there is a gap between what is communicated to consumers and what is actually delivered.

The above findings were supported by the ideas of Davidson (2005) who points out that “information gap” is the difference between customers’ website

requirements and managements' beliefs about those requirements. This gap, acccording to Davidson, usually occurs when there is a lack of timely, accurate information which hinders the managers, policy makers and market participants to develop effective responses. To close this gap, empathic listening to customers and strengthening the relationship by understanding and meeting their needs over time are needed.

On the other hand, Harold (2012) suggests that information quality has positive effects on banking success. Likewise, Wang and Pho (2009), in their study using a research framework based on the DeLone and McLean (2003) Information System success, revealed that website information quality depends on delivering relevant, updated and easy-to-understand information to significantly influence the attitude, satisfaction and purchase/use of bank online services. The authors pointed out that information quality can be measured using information relevance, currency and understandability.

These findings suggest that the respondents have conflicting ideas about the completeness, reliability and the quality of information provided by the banks under study.

Table 5.11 Perceived Information Quality

	1	2	3	4	5	Mean	Description
1. The information provided by my bank for online banking is complete	0.39	0.38	0.24	0.7	0.783	2.52	Undecided
2. My bank provides enough information to convince me that online banking is safe	0.24	0.46	0.35	0.7	1.25	2.95	Undecided
3. The information provided by my bank for online banking is useful	0.41	0.47	0.52	0.6	0.183	2.17	Agree
4. The information provided by my bank for online banking is reliable	0.31	0. 558	0.33	0.7	0.55	2.48	Agree
5. The information provided by my bank when I make online transactions is clear	0.39	0. 7	0.33	0.4	0.517	2.25	Agree
6. Overall the information provided by my bank for online banking is of high quality	0.4	0.58	0.4	0.3	0.5	2.19	Agree

5.7.5 Perceived Risks and Benefits (PRB)

Table 5.12 presents the perceived risks and benefits of the adoption of Internet banking. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from

“strongly agree” to “strongly disagree”. Eighteen items were used to measure this construct. As presented in the table, it is apparent that almost all items were agreed upon by the respondents. These items are as follows: “The risk of fraud using Internet banking is higher than conventional face-to-face banking”, 1.70; “The risk of making a mistake with transactions is higher using Internet banking than conventional face-to-face banking”, 1.55; “The risk of not being able to get a good quality service using online banking is higher than conventional face-to-face banking”,1.38; “I use Internet banking because my friends/family use Internet banking”, 1.877; “Using Internet banking is more risky than conventional face-to-face banking”, 2.27; “Using online banking enables me to accomplish my banking tasks more quickly than conventional face-to-face banking”, 1.91. However, the respondents strongly agreed on the statement: “I think online banking security can be improved by using biometric technology”, 1.403.

In contrast, the respondents were “undecided” on the statements: “Internet banking is more risky than telephone banking”, 3.47; “I can save time using online banking”, 2.69; “I can save money using online banking”, 2.66; “I generally tend not to like taking risks in my life”, 2.61; “I worry about the Internet because I cannot see what is happening”, 2.73; “I was the first to use Internet banking among my family/friends”, 2.813; “I would recommend using Internet banking to my friends”, 2.173. The respondents, however, disagreed on the following statement: “Internet banking is not secure because no human beings are involved”, 4.00. These findings revealed that the participants viewed the adoption

of Internet banking as having its own benefits with corresponding risks. However, they believe that online banking security could be improved by using biometric technology.

The above findings were supported by Zhao et al. (2010) who said perceived risks associated with security and privacy, and the relationship between trust are important influences on customer adoption of Internet banking. Likewise, Cristobal et al. (2007) imparted that a low level of trust tends to inhibit the adoption of Internet banking: because there is no face-to-face interaction when conducting an online transaction, the transmitting of private data and financial details, which is open to abuse, demands a high level of consumer trust. Furthermore, Yoon and Occena (2014) found that both security concerns and usability have significant effects on Internet banking use with a smart phone. From the findings, the study supports the idea that benefits are often accompanied with risk.

Table 5.12 Perceived Risks and Benefits of the Adoption of Internet Banking

Perceived risks and benefits	1	2	3	4	5	Mean	Description
1. The benefits of Internet banking far outweigh the risks	0.18	0.38	0.35	0.97	1.3	3.22	Undecided
2. The risk of fraud using Internet banking is higher than conventional face-to-face banking	0.59	0.49	0.24	0.16	0.2	1.7	Agree
3. The risk of making a mistake with transactions is higher using Internet banking than conventional face-to-face banking	0.6	0.63	0.1	0.16	0.1	1.55	Agree
4. The risk of not being able to get a good quality service using online banking is higher than conventional face-to-face banking	0.7	0.5	0.1	0.04	0.1	1.38	Agree
5. Using Internet banking is more risky than conventional face-to-face banking	0.41	0.56	0.23	0.44	0.6	2.27	Agree
6. Using Internet banking is more risky than telephone banking	0.16	0.22	0.41	1.15	1.5	3.47	Undecided
7. Using online banking is convenient	0.37	0.52	0.35	0.48	0.7	2.4	Agree
8. I can save time using online banking	0.29	0.45	0.46	0.61	0.9	2.69	Undecided
9. Using online banking enables me to accomplish my banking tasks more quickly than conventional face-to-face banking	0.41	0.75	0.34	0.31	0.1	1.913	Agree
10. I can save money using online	0.21	0.61	0.62	0.71	0.5	2.66	Undecided

banking							
11. I generally tend not to like taking risks in my life	0.91	0.81	0.59	0.3	0	2.61	Undecided
12. I worry about the Internet because I cannot see what is happening	0.31	0.4	0.41	0.61	1	2.733	Undecided
13. Internet banking is not secure because no human beings are involved	0.04	0.12	0.59	1.12	2.1	4	Disagree
14. I use Internet banking because my friends/family use Internet banking	0.48	0.57	0.42	0.24	0.2	1.877	Agree
15. I was the first to use Internet banking among my family/friends	0.27	0.43	0.31	1.05	0.8	2.813	Undecided
16. I would recommend using Internet banking to my friends	0.4	0.53	0.5	0.32	0.4	2.173	Undecided
17. I think online banking security can be improved by using biometric technology	0.7	0.49	0.08	0.01	0.1	1.403	Strongly agree
18. I believe online banking security needs to be improved	0.66	0.35	0.35	0.09	0.2	1.597	Agree

Part III: Describes the preference of respondents of the appropriate biometric technologies needed in Internet banking.

5.7.6. Biometric Technology (BT)

Table 5.13 presents the biometric technology to be considered for authenticating the customer: The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” or “strongly disagree”. Nine items were used to measure this construct.

The findings show that from the perspective of the respondents, it would be better to have a fingerprint recognition reader – automated biometric scanner to authenticate the fingerprint of the individual, 2.01, interpreted as “agree”. However, the respondents disagreed on: “Digital signature”, 4.22 and “Hand recognition”, 4.28. In contrast, they neither agree nor disagree on “Iris recognition technology”, 3.277; “Face recognition”, 3.257; “Voice recognition”, 3.45; and “Retina scanner”, 2.893.

The above findings were supported by the ideas of Nasir and Yunos (2005) who imparted that easy access and convenience of Internet banking should not be at the expense and mercy of the security of information. The authors explained that for better security, a three-factor authentication process should be considered with the use of biometric technology such as iris or thumbprint recognition.

Moreover, Sarma and Singh (2010) stressed that biometric technology is also one of the most important technologies for risk management as well as security factors of Internet banking. The London-based consultants Goode Intelligence predicted that some 450 million bank customers globally will use biometrics, which will be the principal banking authentication method by 2020 (Umico, 2015). It was also portrayed in the report that biometrics in banking is already a maturing industry with many successful implementations around the world but there is a related issue of public acceptance. Although biometrics has its advantages, there may be a generally prevalent perception that biometrics are a threat to the privacy of an individual (Sharma and Singh, 2010).

Table 5.13 Biometric Technology to be considered for Authenticating the Customer

	1	2	3	4	5	Mean	Description
1. Fingerprint recognition reader – automated biometric scanner to authenticate the fingerprint of the individual	0.48	0.5	0.35	0.35	0.3	2.01	Agree
2. Digital signature – smart pen which tracks the pressure on paper and angle	0.05	0.11	0.15	1.23	2.7	4.22	Disagree

of the pen							
3. Hand recognition – a mouse that will use infrared light to scan the structure inside the hand: blood vessels, veins, fatty tissue tendons and any deep scars	0.03	0.09	0.32	0.99	2.9	4.28	Disagree
4. Iris recognition technology – can work at a distance of 20 inches and scans your eye	0.2	0.29	0.39	0.99	1.4	3.277	Undecided
5. Face recognition – analyses the spacing between facial features and scans your face	0.17	0.4	0.39	0.87	1.4	3.257	Undecided
6. Voice recognition – technology which recognises the voice of the individual when speaking	0.16	0.29	0.22	1.24	1.5	3.45	Undecided
7. Retina scanner – Recognises the retina and scans your eye	0.26	0.34	0.53	0.81	1	2.893	Undecided

Part IV: Hofstede's five dimensions of cultural values at the individual level to validate the barriers towards the adoption of Internet banking in the Kingdom of Bahrain.

5.7.7 Cultural Dimensions (CD)

This section deals with the perceptions of cultural dimensions that may affect the Internet adoption of banking services among participants.

Table 5.14 presents the perceptions on power distance which measures the way in which different cultures approach and accept inequalities between individuals of a society. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from "strongly agree" to "strongly disagree". Five items were used to measure this construct.

As presented in the table, all statements in power distance dimensions were "agreed" upon by the respondents. The lowest mean was reflected in the statement: "People in lower positions should not disagree with decisions by people in higher positions", with a mean average of 2.22. This was followed by: "People in higher positions should make most decisions without consulting people in lower positions", 2.3; and "People in higher positions should not ask the

opinions of people in lower positions too frequently", 2.33. The respondents also agreed on the "People in higher positions should avoid social interaction with people in lower positions" statement, 2.51, and "People in higher positions should not delegate important tasks to people in lower positions", 2.63.

This study supports the findings of Phan et al. (2002) and Png et al. (2001) who found that cultures with high power distance lacked the enthusiasm to adopt information systems, in this case, Internet banking in the Kingdom of Bahrain. According to Hofstede, a typical high score for this dimension characterises a culture with a paternalistic decision-making style where the employee or the subordinate is afraid to manifest his disagreement with the superior and is rather glad to accept his superior's decisions. Li et al. (2009) point out that in technology usage, high power distance users pay more attention to the community's reaction to the technology, and then alter their reaction, relying on their place within the hierarchical structure. However, low power distance users are more self-governing in their technology use.

Table 5.14 Perceptions of Power Distance

Cultural dimensions	1	2	3	4	5	Mean	Description
PO1. People in higher positions should make most decisions without	0.43	0.39	0.29	0.79	0.4	2.3	Agree

consulting people in lower positions							
PO2. People in higher positions should not ask the opinions of people in lower positions too frequently	0.46	0.29	0.37	0.57	0.6	2.33	Agree
PO3. People in higher positions should avoid social interaction with people in lower positions	0.38	0.41	0.18	0.96	0.6	2.51	Undecided
PO4. People in lower positions should not disagree with decisions by people in higher positions	0.45	0.39	0.33	0.67	0.4	2.22	Agree
PO5. People in higher positions should not delegate important tasks to people in lower positions	0.36	0.35	0.36	0.57	1	2.63	Undecided

The next dimension in Table 5.15 is uncertainty avoidance. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” or “strongly disagree”. Five items were used to measure this construct.

As reflected in the table, it could be noted that the lowest mean was found for the statement: “Standardised work procedures are helpful”, 1.93, interpreted as “agree”. All other statements were agreed upon by the respondents: “It is important to have instructions spelled out in detail so that I always know what I’m expected to do”, 2.34; “It is important to closely follow instructions and procedures”, 2.35; “Rules and regulations are important because they inform me of what is expected of me”, 2.12; “Instructions for operations are important”, 2.37, interpreted as “agree”.

According to Hosftede, uncertainty avoidance is the extent to which a culture programmes its members to feel either uncomfortable or comfortable, in unstructured situations. Unstructured situations are novel, unknown, surprising or different from usual (Wei et al., 2008). In high uncertainty avoidance cultures, users have a low tolerance of the unknown and risk. When high uncertainty avoidance users do not avoid ambiguous situations, they will seek easy rules, in order to decrease the ambiguity. Generally, high uncertainty avoidance users are expected to comply with their community beliefs more when adopting technology; the opposite is true for low uncertainty avoidance culture users (Li et al., 2009).

Bahrain, which is a part of the Arab culture, scores 68 on this dimension and thus has a high preference for avoiding uncertainty. The literature suggests that higher uncertainty avoidance would influence the adoption of information systems (IS) negatively. Although literature rating the Arab Gulf region is also high on uncertainty avoidance, there exists an extensive IS adoption.

Table 5.15 Perceptions of Uncertainty Avoidance

Dimensions	1	2	3	4	5	Mean	Description
UN1. It is important to have instructions spelled out in detail so that I always know what I'm expected to do	0.43	0.39	0.26	0.77	0.5	2.34	Agree
UN2. It is important to closely follow instructions and procedures	0.45	0.35	0.2	0.75	0.6	2.35	Agree
UN3. Rules and regulations are important because they inform me of what is expected of me	0.48	0.43	0.24	0.63	0.4	2.127	Agree
UN4. Standardised work procedures are helpful	0.54	0.45	0.19	0.45	0.3	1.93	Agree
UN5. Instructions for operations are important	0.39	0.45	0.25	0.87	0.4	2.377	Agree

The next dimension in Table 5.16 is individualism versus collectivism. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from strongly agree or strongly disagree. Six items were used to measure this construct. As presented in the table, all statements were “agreed” upon by the participants, with the lowest mean reflected in the statement: “Group welfare is more important than individual rewards”, 2.06, interpreted as “agree”. Other statements approved by the participants were: “Individuals should stick with the group even through difficulties”, 2.2; and “Individuals should only pursue their goals after considering the welfare of the group”, 2.05. However, two statements were given undecided remarks by the respondents: “Group loyalty should be encouraged even if individual goals suffer”, 2.51; and “Group success is more important than individual success”, 3.48.

In this dimension of culture, individuals are supposed to look after themselves or remain integrated into groups and family (Wei et al., 2008). In high collectivist cultures, users have a tendency to focus more on the community to which they belong. They are more impacted by their peers and superiors, by satisfying their opinions, however, the opposite occurs in individualistic cultures. In technology adoption and use, high collectivism users care more about regarding how their community is possibly affected by their adoption behaviours (Li et al., 2009). This

dimension is meant to assess the role of the individual and of the group in a given society.

The findings support Hofstede's cultural dimension on low individualism (IDV) where in technology adoption and use, high collectivism users care more about regarding how their community is possibly affected by their adoption behaviours (Li et al., 2009). This was reflected in their strong agreement on psychological and technical barriers on Internet banking adoption: "Hinders social relations" and "Insufficient help desk information when something goes wrong during Internet transactions".

Table 5.16 Perceptions of Individualism versus Collectivism

Dimensions	1	2	3	4	5	Mean	Description
CO1. Individuals should sacrifice self-interest for the group (either at school or the workplace)	0.38	0.46	0.2	0.93	0.4	2.41	Agree
CO2. Individuals should stick with the group even through difficulties	0.43	0.47	0.33	0.64	0.3	2.2	Agree
CO3. Group welfare is more important than individual	0.43	0.58	0.38	0.36	0.3	2.06	Agree

rewards							
CO4. Group success is more important than individual success	0.13	0.27	0.52	0.97	1.6	3.48	Undecided
CO5. Individuals should only pursue their goals after considering the welfare of the group	0.43	0.59	0.41	0.31	0.3	2.05	Agree
CO6. Group loyalty should be encouraged even if individual goals suffer	0.4	0.43	0.21	0.49	1	2.51	Undecided

Table 5.17 presents the perceptions on masculinity versus femininity. The level of agreement or disagreement of the selected respondents was measured by using the five-point Likert scaling method ranging from “strongly agree” or “strongly disagree”. Four items were used to measure this construct.

It can be noted that the lowest mean was reflected in the statement: “It is more important for men to have a professional career than it is for women”, 1.9, interpreted as “agree”. All other statements agreed upon by the participants were: “Men usually solve problems with logical analysis; women usually solve problems with intuition”, 2.153; and “Solving difficult problems usually requires an

active, forcible approach, which is typical of men", 2.16; "There are some jobs that a man can always do better than a woman", 2.14.

This dimension refers to the degree to which tough values, such as assertiveness, performance, success and competition (which are associated with the role of men), prevail over tender values, such as quality of life, maintaining warm personal relationships, service, care for the weak and solidarity (which are associated with women's roles) (Wei et al., 2008). In using technology, feminine users usually care more about building relationships with other users, than the technology itself. They focus on maintaining interdependency and accepting others' suggestions and desires. Users with feminine values are expected to conform to social pressures more than those with highly masculine values (Li et al., 2009).

The Arab world scores 52 on this dimension, and is thus a masculine society. In masculine countries people "live in order to work", managers are expected to be decisive and assertive, the emphasis is on equity, competition and performance, and conflicts are resolved by fighting them out. In using technology, feminine users usually care more about building relationships with other users, than the technology itself. They focus on maintaining interdependency and accepting others' suggestions and desires. Users with feminine values are expected to conform to social pressures more than those with highly masculine values (Li et al., 2009). This finding implies that although Bahrain is, generally, a masculine

society as a result of their Arab culture, adoption of technology reveals their feminine values which they said “hinder social relations”.

Table 5.17 Perceptions of Masculinity versus Femininity

Dimensions	1	2	3	4	5	Mean	Description
MA1. It is more important for men to have a professional career than it is for women	0.55	0.42	0.24	0.39	0.3	1.9	Agree
MA2. Men usually solve problems with logical analysis; women usually solve problems with intuition	0.47	0.43	0.3	0.47	0.5	2.153	Agree
MA3. Solving difficult problems usually requires an active, forcible approach, which is typical of men	0.46	0.39	0.39	0.59	0.3	2.16	Agree
MA4. There are some jobs that a man can always do better than a woman	0.48	0.39	0.36	0.39	0.5	2.14	Agree

5.8 Summary of Hofstede's Findings in the Arab World

To support the above findings, the summary of Hofstede's findings in the Arab world is presented in Table 5.19. The Arab world findings reflect PDI, IDV, MAS and UAI but not LTO. Hofstede has identified large PDI (80) and UAI (68) for the Arab world where the society is highly rule-oriented, risk averse and does not readily accept change. Hierarchy in an organisation is seen as reflecting inherent inequalities. Centralisation is popular, subordinates expect to be told what to do and the ideal boss is a benevolent. The Arab world has a high preference for avoiding uncertainty, a culture that maintains rigid codes of belief and behaviour, and is intolerant of unorthodox behaviour and ideas. Moreover, there is an emotional need for rules and innovation that may be resisted, and security is an important element in individual motivation. Furthermore, according to Hofstede, the high MAS index (52) may be more a result of the Muslim religion than culture. In masculine countries people "live in order to work". Finally, the relatively low IDV (38) indicates a society where loyalty and close long-term commitment to groups such as family is paramount. This is manifested in a close long-term commitment to the member 'group', be that a family, extended family or extended relationships. Loyalty in a collectivist culture is paramount, and overrides most other societal rules and regulations.

Table 5.18 The Arab World Findings Based on Hofstede's Dimensions of Culture

Dimension	Score	Description
1. Power Distance Index (PDI)	80	High
2. Individualism (IDV)	38	Low
3. Masculinity (MAS)	52	High
4. Uncertainty Avoidance Index (UAI)	68	High
5. Long Term Orientation (LTO)	Not applicable	None

Legend:

PDI – Power Distance Index
IDV– Individualism
MAS – Masculinity
UAI – Uncertainty Avoidance Index
LTO – Long Term Orientation

5.9 Results of the Reliability Statistics

In order to know if the research instrument was reliable, Cronbach's alpha was used. In this study, the Cronbach's alpha was computed and the results were compared with the 0.7 level recommended as a cut-off point, which showed that scales were reliable (Nunnally and Bernstein, 1994). The hypothesised

relationships and reliability described in the model were tested using SPSS Amos version 18 software for the type of internal consistency reliability. The higher the score, the more reliable the generated scale is. Nunnaly (1994) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature as shown in Table 5.19.

Table 5.19 Results of the Reliability Statistics

Privacy

Cronbach's Alpha		N of Items
Perceived Privacy Protection (PPP)	.837	9

Security

Cronbach's Alpha		N of Items
Perceived Security Protection (PSP)	.855	10

Trust

Cronbach's Alpha		N of Items
Perceived Trust (PT)	.777	6

Information Quality

Cronbach's Alpha		N of Items
Perceived Information Quality (PIQ)	.749	6

Risk and Benefits

Cronbach's Alpha		N of Items
Perceived Risks & Benefits (PRB)	.889	18

Cultural Dimensions

Cronbach's Alpha		N of Items
Cultural Dimensions (CD)	.878	20

Biometric Technology

Cronbach's Alpha		N of Items
Biometric Technology (BT)	.714	7

5.9.1 Perceived Privacy Protection (PPP)

According to the proposed model, the constructs that described the perceived privacy protection (PPP) as a factor influencing the adoption of Internet banking were proposed as follows:

PPP1: My bank keeps all my personal information confidential.

PPP2: The personal information held by my bank is used only for improving the accuracy of the services they provide me.

PPP3: The personal information held by my bank is not shared with other organisations without my consent.

PPP4: The personal information held by my bank is stored and used according to legal or regulatory requirements only.

PPP5: Overall, I am confident that my personal information held by my bank is kept private.

PPP6: When I use online banking I am concerned about the privacy of my personal information.

PPP7: Unauthorised persons (i.e. hackers) have access to my personal information when I use online banking.

PPP8: I am concerned that too much personal information is being collected when I use online banking.

PPP9: The information collected when I use online banking will be kept private by my bank.

As shown in Table 5.19 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimation of the relationships among these constructs which the Cronbach's alpha average at .837 that support the PPP variables.

5.9.2 Perceived Security Protection (PSP)

According to the proposed model, the constructs that described the perceived security protection (PSP) as a factor influencing the adoption of Internet banking were proposed as follows:

PSP1: Security features are important to me when choosing Internet banking.

PSP2: My bank implements security measures to protect me when I use online banking.

PSP3: My bank provides a secured service when I use Internet banking.

PSP4: I feel secure when using Internet banking.

PSP5: I use online banking because I believe it is secure.

PSP6: I think current password-based authentication for online banking is very secure.

PSP7: I do not/would not use online banking because it is not secure.

PSP8: I use online banking even though I believe it is not secure.

PSP9: My bank usually ensures that transactional information is protected from accidentally being altered or destroyed during a transmission on the Internet.

PSP10: In general, online banking is riskier than telephone banking.

As shown in Table 5.20 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimation the relationships among these constructs which the Cronbach's Alpha average at .855 that support the PSP variables.

5.9.3 Perceived Trust (PT)

According to the proposed model, the constructs that described the perceived trust (PT) as a factor influencing the adoption of Internet banking were proposed as follows:

PT1: Overall my bank provides an online service that is trustworthy.

PT2: I trust my bank to keep its promises and commitments.

PT3: I trust my bank to resolve any issues if something goes wrong with my online banking transactions.

PT4: Overall I trust my bank to provide me with secure online banking services.

PT5: I would never use online banking services because I don't trust my bank to provide a secure service.

PT6: I would never use online banking services because the Internet is not secure.

As shown in Table 5.21 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimation the

relationships among these constructs which the Cronbach's Alpha average at .777 that support the PT variables.

5.9.4 Perceived Information Quality (PIQ)

According to the proposed model, the constructs that described the perceived information quality (PIQ) as a factor influencing the adoption of Internet banking were proposed as follows:

PIQ1: The information provided by my bank for online banking is complete.

PIQ2: My bank provides enough information to convince me that online banking is safe.

PIQ3: The information provided by my bank for online banking is useful.

PIQ4: The information provided by my bank for online banking is reliable.

PIQ5: The information provided by my bank when I make online transactions is clear.

PIQ6: Overall the information provided by my bank for online banking is high quality.

As shown in Table 5.22 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimation the relationships among these constructs which the Cronbach's Alpha average at .749 that support the PIQ variables.

5.9.5 Perceived Risks and Benefits (PRB)

According to the proposed model, the constructs that described the perceived risks and benefits (PRB) as a factor influencing the adoption of Internet banking were proposed as follows:

PRB1: The benefits of Internet banking far outweigh the risks.

PRB2: The risk of fraud using Internet banking is higher than conventional face-to-face banking.

PRB3: The risk of making a mistake with transactions is higher using Internet banking than conventional face-to-face banking.

PRB4: The risk of not being able to get a good quality service using online banking is higher than conventional face-to-face banking.

PRB5: Using Internet banking is more risky than conventional face-to-face banking.

PRB6: Using Internet banking is more risky than telephone banking.

PRB7: Using online banking is convenient.

PRB8: I can save time using online banking.

PRB9: Using online banking enables me to accomplish my banking tasks more quickly than conventional face-to-face banking.

PRB10: I can save money using online banking.

PRB11: I generally tend not to like taking risks in my life.

PRB12: I worry about the Internet because I cannot see what is happening.

PRB13: Internet banking is not secure because no human beings are involved.

PRB14: I use Internet banking because my friends/family use Internet banking.

PRB15: I was the first to use Internet banking among my family/friends.

PRB16: I would recommend using Internet banking to my friends.

PRB17: I think online banking security can be improved by using biometric technology.

PRB18: I believe online banking security needs to be improved.

As shown in Table 5.23 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimation the relationships among these constructs which the Cronbach's Alpha average at .889 that support the PRB variables.

5.10 Cultural Dimensions (CD)

According to the proposed model, the constructs that described the cultural dimensions (CD) as a factor influencing the adoption of Internet banking were proposed as follows:

CD1: People in higher positions should make most decisions without consulting people in lower positions.

CD2: People in higher positions should not ask the opinions of people in lower positions too frequently.

CD3: People in higher positions should avoid social interaction with people in lower positions.

CD4: People in lower positions should not disagree with decisions by people in higher positions.

CD5: People in higher positions should not delegate important tasks to people in lower positions.

CD6: It is important to have instructions spelled out in detail so that I always know what I'm expected to do.

CD7: It is important to closely follow instructions and procedures.

CD8: Rules and regulations are important because they inform me of what is expected of me.

CD9: Standardised work procedures are helpful.

CD10: Instructions for operations are important.

CD11: Individuals should sacrifice self-interest for the group (either at school or the workplace).

CD12: Individuals should stick with the group even through difficulties.

CD13: Group welfare is more important than individual rewards.

CD14: Group success is more important than individual success.

CD15: Individuals should only pursue their goals after considering the welfare of the group.

CD16: Group loyalty should be encouraged even if individual goals suffer.

CD17: It is more important for men to have a professional career than it is for women.

CD18: Men usually solve problems with logical analysis; women usually solve problems with intuition.

CD19: Solving difficult problems usually requires an active, forcible approach, which is typical of men.

CD20: There are some jobs that a man can always do better than a woman.

As shown in Table 5.24 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimating the relationships among these constructs which the Cronbach's Alpha average at .878 that support the CD variables.

5.11 Biometric Technology (BT)

According to the proposed model, the constructs that described the biometric technology (BT) as a factor influencing the adoption of Internet banking were proposed as follows:

BT1: Fingerprint recognition reader – automated biometric scanner to authenticate the fingerprint of the individual.

BT2: Digital signature – smart pen which tracks the pressure on paper and angle of the pen.

BT3: Hand recognition – a mouse that will use infrared light to scan the structure inside the hand, blood vessels, veins, fatty tissue tendons and any deep scars.

BT4: Iris recognition technology – can work at a distance of 20 inches and scans your eye.

BT5: Face recognition – analyses the spacing between facial features and scans your face.

BT6: Voice recognition – technology which recognises the voice of the individual when speaking.

BT7: Retina scanner – recognises the retina and scans your eye.

As shown in Table 5.25 below, in order to have a meaningful data interpretation reliability and validity of the measures, theoretical constructs and estimation the relationships among these constructs which the Cronbach's alpha average at .714 that support the BT variables.

5.12 Testing the Reliable Model

This study based its conceptual model on the TAM of which five variables were taken into consideration: perceived privacy protection (PPP), perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ) and perceived risks/benefits (PRB). In addition, two more variables were included: cultural dimension (CD) and biometric technology (BT) to measure a significant relationship with any of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain. The conceptual model to be tested is presented below:

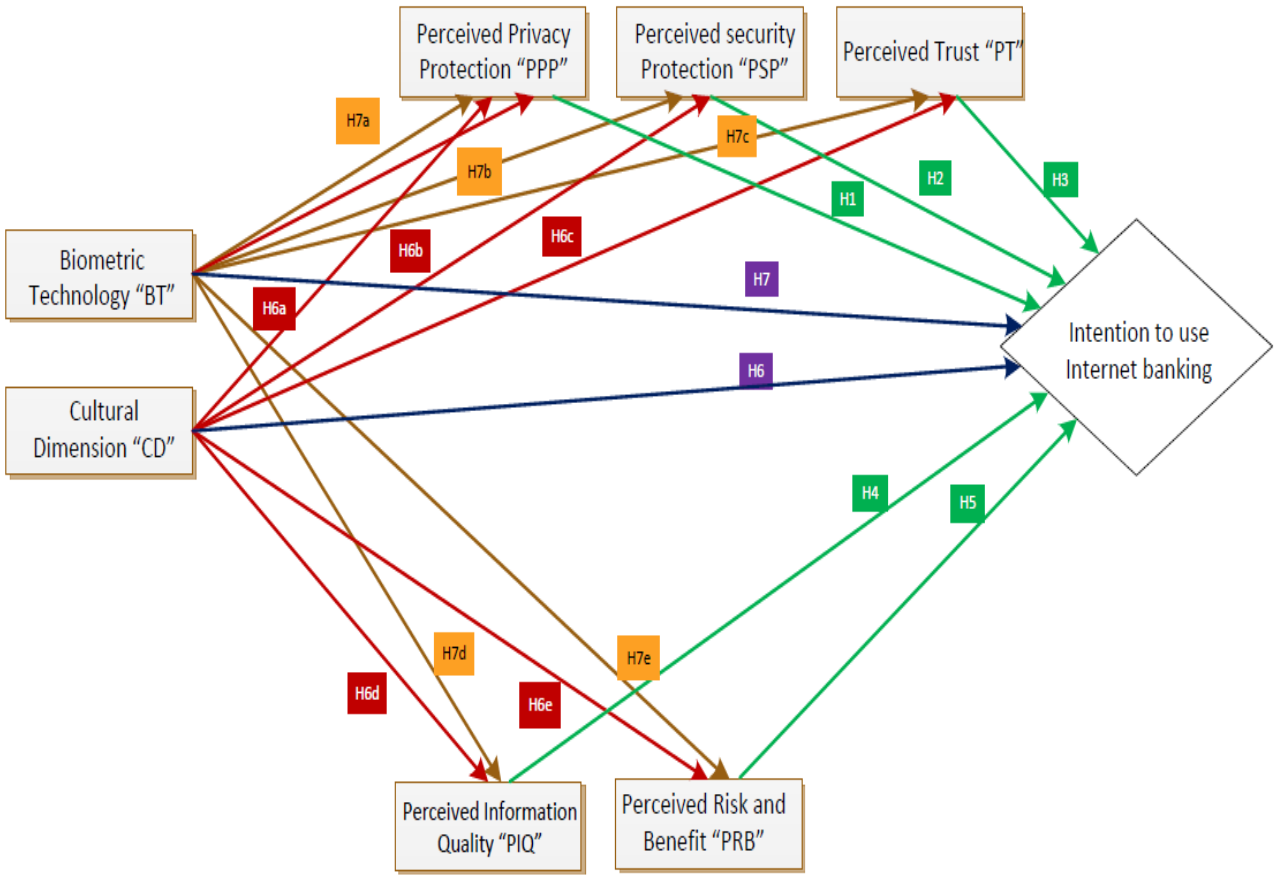

Figure 5.1 Conceptual Models (Developed by the Researcher)

The model constructs of the major variables were purified and tested based on the point of view of the customer respondents. A factor analysis was made to discover the factor loading in the proposed reliable model and find the possible underlying factors by testing the normality of the data collected from customer respondents. In this model, variable PSP9 fell outside the acceptable range for values of skewness and kurtosis (skewness value = 8.469 >2, and kurtosis value = 103.563 >3); moreover, the kurtosis value of perceived risks and benefits (PRB) is 3.525 which also fell outside the range for values of kurtosis. However,

due to the sample size, the impact of skewness and kurtosis might not make a significant difference in further analyses (Tabachnick and Fidell, 2001). Skewness is a measure of a dataset's symmetry or lack of symmetry (Wheeler, 2016). This means a perfectly symmetrical dataset will have a skewness of 0 while the normal distribution has a skewness of 0. On the other hand, kurtosis is a measure of the combined sizes of the two tails; it measures the amount of probability in the tails in which the value is often compared to the kurtosis of the normal distribution, which is equal to 3. If the kurtosis is greater than 3, then the dataset has heavier tails than a normal distribution (more in the tails). If the kurtosis is less than 3, then the dataset has lighter tails than a normal distribution (less in the tails).

5.13 Exploratory Factor Analysis (EFA) – Customers

A random sample of 300 customer respondents was selected and treated using SPSS Amos version 18 software. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity were conducted before the factor analysis. These two tests provide a minimum standard which should be passed before a factor analysis can be conducted. The first test was the Kaiser-Meyer-Olkin Measure of Sampling Adequacy wherein values closer to 1 are better and a value of .6 is a suggested minimum. On the other hand, Bartlett's Test of Sphericity tests the null hypothesis that the correlation matrix in which all of the diagonal elements are 1 and all off-diagonal elements are 0.

The results are shown in Table 5.26. Bartlett's Test of Sphericity intends to determine if there is a high degree of correlation between the variables included. The null hypothesis here is H_0: the items are uncorrelated. Table 5.28, as shown in Appendix B, shows that the p-value = 0.000 <0.001, therefore making a factor analysis meaningful. In addition, since the global statistic Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.649 >0.50, it demonstrates that a factor analysis may be performed (Field, 2009).

Table 5.26 KMO and Bartlett's Test (Reliability Statistics)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.649
Bartlett's Test of Sphericity	Approx. Chi-Square	3457.776
	df	2850
	Sig.	.000

Moreover, the values in the communalities extraction column show that all parts of the variance of each variable is explained by a given number of factors greater than 0.5 and then all variables are relevant; Table 5.29 (Appendix B). Furthermore, the component matrix represented in Table 5.30 (Appendix B) only contains values for the seven relevant factors, and these values are also referred

to as “factor loading”, which corresponds to the correlation between a set of factor scores and a set of scores for an original variable (Janssens et al., 2008; Field, 2009; Hair et al., 2010). Table 5.30 shows that the correlation between the variables and the factors is not exclusive. Therefore, all of the variables are correlated to a greater or lesser degree with all the factors, although this may be much less applicable to one factor than another. After rotation of the component matrix, the results in Table 5.31 (Appendix B) indicate that the constructs are classified in three components.

Table 5.31 (Appendix B) shows also that some of the items load high on the expected two underlying dimensions while others do not. The law states that it requires a minimum loading of 0.50 on a certain factor or construct, but at the same time no more than 0.30 on another factor; then we may conclude that most of the items satisfy this requirement, except for: PIQ2, CD7, PPP5, PT2, PSP1, PRB2, PT3 and CD6. This may be an indication that these items should be kept out of the analysis. For the time being, these items will continue to be concluded in the CFA and the remaining items were retained including those that contributed to lower correlation value. The reason for retaining those items despite contributing to lower correlation was that the content was important and those items contributed to measurement significantly. In addition, correlation values for those items had the potential to improve with minor modification to the wordings and larger sample size. These results also show that there is cross loading among all the factors. Hence, for a visual representation that specifies

the model's constructs, indicator variables and interrelationships, confirmatory factor analysis (CFA) should be carried out. CFA provides quantitative measures of the reliability and validity of the constructs. With these results, this study will carry out the CFA on the holdout sample using only seven factors: PPP, PSP, PIQ, PRB, CD, PT and BT in the model represented in Figure 5.2 below.

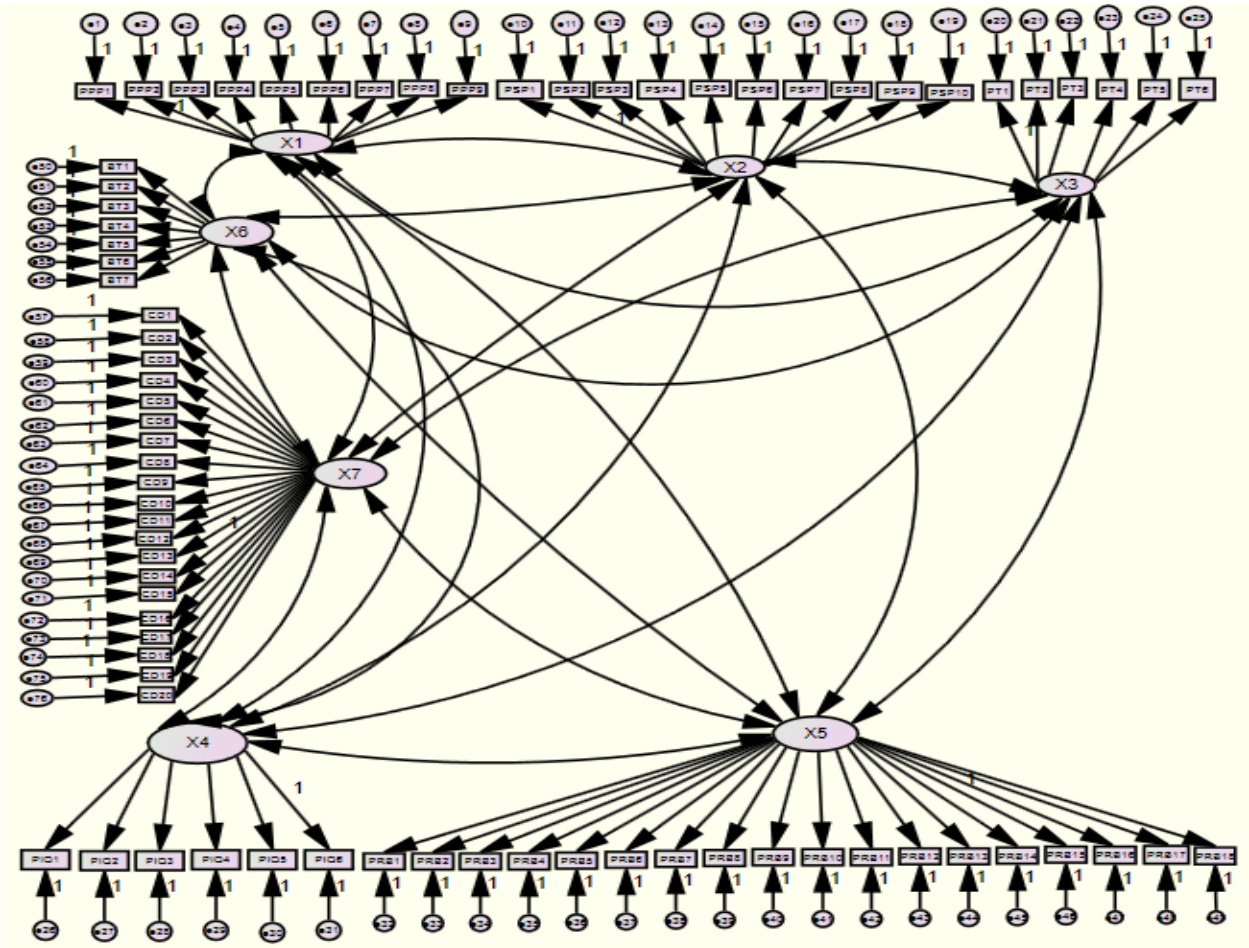

Figure 5.2 Exploratory Factor Model

5.14 Confirmatory Factor Analysis (CFA) – Customers

A confirmatory factor analysis (CFA) was used to identify the causal relationships among observed factors and the fundamental theoretical constructs. Furthermore, CFA was used to test how well the measured variables represent the number of constructs in order to confirm or reject the measurement theory (Statistics Solutions, 2013). To achieve this analysis, Amos 18 was used. The paths among the fundamental exogenous and endogenous constructs were classified in the structural model, which is the second stage. Exogenous variables are the predictor variables, namely, PPP, PSP, PT, PIQ, PRB, BT and CD. The endogenous variables are the resulting variables that are a causal relationship.

To have the right decisions concerning reliable factors, there is a need to examine these items based on the following: unidimensionality, convergent validity, reliability and discriminant validity. Technically speaking, to run the model in Figure 5.1, there is a need to replace PPP, PSP, PT, PIQ, PRB, BT and CD with the symbols X1, X2, X3, X4, X5, X6 and X7.

5.14.1 Unidimensionality

In this feature, there is a need to examine that a set of variables has only one underlying dimension. In Table 5.32 (in Appendix B), “Regression weights” shows that all of the unstandardised loadings (regression weights) differ significantly from zero as indicated in the Critical Ratio (CR = t-value) that their values are all greater than 1.96. However, the loading for all variables measures have a high loading (>0.50) except for the variables: PPP4, PSP3, PT4, PT5, PRB17, PRB18, BT4, CD1 and CD16 and CD4 (their respective loading values are 0.432, 0.376, 0.473, 0.499, 0.283, 0.275, 0.431, 0.268, 0.433 and 0.442). So it is better to check the values measures in the Standardised regression weight for these variables before being removed. Moreover, Table 5.33 shows that the Standardised regression weight for PPP4, PSP3, PT4, PT5, PRP17, PRB18, BT4, CD1, CD16 and CD4 are more than 0.50 (0.867, 0.825, 0.821, 0.818, 0.813, 0.804, 0.929, 0.980, 0.970 and 0.986 respectively), and in reviewing the model, these variables will remain for the time being in the model. However, Table 5.34 indicates that the root mean square error of approximation (RMSEA) is 0.045, which is less than 0.08, indicates that the fit may be viewed as acceptable; furthermore, Table 5.35 in Appendix B shows that the Goodness of Fit Index (GFI) is equal to 0.940 >0.90 and the Adjusted Goodness of Fit Index (AGFI) is equal to 0.823 >0.80 which indicate a good fitness of the model. In addition, Table 5.34 shows that the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) are equal to 0.910 and 0.974 and both of these values are greater than 0.90. Hence the “overall fit” (general quality) of the

measurement model is good. Therefore, it is preferable to keep the variables PPP4, PSP3, PT4, PT5, PRP17, PRB18, BT4, CD1, CD16 and CD4. A model is regarded as acceptable if: the Goodness of Fit Index exceeds .90 (Byrne, 1994); the Comparative Fit Index exceeds .90 (Byrne, 1994); RMS is less than .08 (Browne and Cudeck, 1993) – and ideally less than .05 (Stieger, 1990). Alternatively, the upper confidence interval of the RMS should not exceed .08 (Hu and Bentler, 1998). The relative chi-square should be less than 2 or 3 (Kline, 1998; Ullman, 2001).

5.14.2 Convergent Validity

Convergent validity is a feature that shows the degree to which two distinct indicators of a given latent variable confirm one another. One of the remarkable conditions in the output is that Table 5.32 (Appendix B) shows that each of the loadings is significant (all of the CR >1.96); another strict condition is that the correlation between each indicator and the corresponding latent variable >0.50 as shown in Table 5.33. These two conditions are satisfied which indicate a convergent validity of the model.

5.14.3 Reliability

After convergent validity a reliability should be verified because a model could be reliable without being convergent valid. The reliability is determined on the basis of the "Composite Reliability" or "Construct Reliability" and the "Variance Extracted" that are calculated for each latent variable where the measurement error = 1 – (the reliability of the indicator), and the standardised loadings is the square multiple correlation as shown below in Table 5.34.

Table 5.34 RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.079	.940	.823	.593
Saturated model	.000	1.000		
Independence model	.758	.637	.524	.425

By using Table 5.33 (Standardised regression weights) and Table 5.37 (Squared multiple correlations), Table 5.38, shown below (Calculation of the Composite Reliability), shows the calculation of Composite Reliability of each latent variable.

Table 5.33 Standardised Regression Weights (Group number 1 – Default Model)

			Estimate
PPP1	<---	X1	.552
PPP2	<---	X1	.692
PPP3	<---	X1	.719
PPP4	<---	X1	.567
PPP5	<---	X1	.502
PPP6	<---	X1	.811
PPP7	<---	X1	.906
PPP8	<---	X1	.727
PPP9	<---	X1	.559
PSP1	<---	X2	.761
PSP2	<---	X2	.724
PSP3	<---	X2	.511
PSP4	<---	X2	.611
PSP5	<---	X2	.734
PSP6	<---	X2	.667
PSP7	<---	X2	.688
PSP8	<---	X2	.755
PSP9	<---	X2	.503
PSP10	<---	X2	.894
PT1	<---	X3	.686
PT2	<---	X3	.788
PT3	<---	X3	.748
PT4	<---	X3	.686
PT5	<---	X3	.818
PT6	<---	X3	.673
BT7	<---	X6	.704
BT6	<---	X6	.670
BT5	<---	X6	.621
BT4	<---	X6	.659
BT3	<---	X6	.580
BT2	<---	X6	.613
BT1	<---	X6	.617
CD15	<---	X7	.744
CD14	<---	X7	.709
CD13	<---	X7	.639
CD12	<---	X7	.651
CD11	<---	X7	.591
CD10	<---	X7	.594
CD9	<---	X7	.700
CD8	<---	X7	.904
CD7	<---	X7	.506
CD6	<---	X7	.705
CD5	<---	X7	.702
CD4	<---	X7	.512
CD3	<---	X7	.817
CD2	<---	X7	.801
CD1	<---	X7	.520
CD16	<---	X7	.515
CD17	<---	X7	.756
CD18	<---	X7	.686
CD19	<---	X7	.553
CD20	<---	X7	.660
PRB15	<---	X5	.952
PRB14	<---	X5	.510
PRB13	<---	X5	.721
PRB12	<---	X5	.807
PRB11	<---	X5	.877
PRB10	<---	X5	.912
PRB9	<---	X5	.744
PRB8	<---	X5	.700
PRB7	<---	X5	.831
PRB6	<---	X5	.596
PRB5	<---	X5	.798
PRB4	<---	X5	.579
PRB3	<---	X5	.516
PRB2	<---	X5	.808
PRB1	<---	X5	.764
PRB16	<---	X5	.798
PRB17	<---	X5	.522
PRB18	<---	X5	.592
PIQ6	<---	X4	.816
PIQ5	<---	X4	.955
PIQ4	<---	X4	.511
PIQ3	<---	X4	.832
PIQ2	<---	X4	.720
PIQ1	<---	X4	.914

Table 5.37 Calculation of the Composite Reliability

	Standardized Regression weight	*Squared Multiple Correlation*	*1- (Squared Multiple Correlation)*	*Construct Reliability*
PPP1	0.967	0.935	0.065	
PPP2	0.988	0.976	0.024	
PPP3	0.899	0.809	0.191	
PPP4	0.867	0.752	0.248	
PPP5	0.977	0.955	0.045	
PPP6	0.830	0.689	0.311	
PPP7	0.823	0.678	0.322	
PPP8	0.980	0.961	0.039	
PPP9	0.989	0.978	0.022	
PPP				
sum	8.320			
sum ^{2}	69.222	*sum*	1.267	0.982
PSP1	0.866	0.750	0.250	
PSP2	0.908	0.824	0.176	
PSP3	0.825	0.680	0.320	
PSP4	0.855	0.730	0.270	
PSP5	0.857	0.734	0.266	
PSP6	0.924	0.853	0.147	
PSP7	0.933	0.870	0.130	
PSP8	0.973	0.946	0.054	
PSP9	0.901	0.812	0.188	
PSP10	0.861	0.741	0.259	
PSP				
sum	8,903			
sum^2	79.263	*sum*	2.060	0.975
PT1	0.979	0.959	0.041	
PT2	0.985	0.970	0.030	
PT3	0.937	0.878	0.122	
PT4	0.821	0.675	0.325	
PT5	0.818	0.670	0.330	
PT6	0.973	0.947	0.053	
PT				
sum	5.513			
sum ^{2}	30.393	*sum*	0.901	0.971

Table 5.38 Mutual Variances between the Latent Variables

	X7	X1	X5	X6	X4	X3	X2
X7	.925						
X1	.852	.859					
X5	.817	.808	.829				
X6	.832	.828	.826	.840			
X4	.834	.828	.841	.812	.843		
X3	.846	.848	.843	.810	.823	.850	
X2	.714	.781	.632	.600	.624	.762	.794

These calculations in Table 5.37 show that the composite reliabilities of PPP, PSP, PT, BT, CD, PRB and PIQ are 0.982, 0.975, 0.971, 0.973, 0.996, 0.989 and 0.970 respectively, where each of these values is greater than 0.70. So the first condition for measuring reliability is being satisfied. Moreover, Table 5.38 shows the calculation of variance extracted criterion. This criterion indicates which part of the collective variance of the indicators may be found in the latent variable. The results show that the constructs PPP, PSP, PT, BT, CD, PRB and PIQ have values 0.859, 0.794, 0.850, 0.840, 0.925, 0.829 and 0.843 respectively, and each one of these values is greater than 0.50. So the second condition for measuring reliability is being satisfied. Hence, we may decide that all of the individual indicators have been measured consistently.

5.14.4 Discriminant Validity

The satisfaction of this feature is satisfied if the correlation between constructs differs significantly from one or if the chi-square difference test indicates that two constructs are not perfectly correlated. Table 5.38 (in Appendix B) represents the correlation between constructs. It indicates a strong positive correlation between the constructs.

Table 5.38 presents the mutual variances between the latent variables PPP, PSP, PT, BT, CD, PRB and PIQ which may be used to check for the presence of discriminant validity. The elements on the diagonal correspond with the average variance extracted (AVE) of the constructs (0.859, 0.794, 0.850, 0.840, 0.925, 0.829 and 0.843). The non-diagonal elements are calculated as the square of the correlations between the constructs. For example, the value 0.841 in Table 4.21 is obtained by squaring 0.917 in Table 5.38. As shown in Table 5.38, none of the variances that are shared by two constructs (squared correlation) are higher than the AVE of these constructs.

Hence, it indicates discriminant validity for the seven constructs that were formed. Discriminant validity assumes that items should correlate higher among them than they correlate with other items from other constructs that are theoretically supposed not to correlate. This means that correlations between theoretically similar measures should be “high” while correlations between theoretically dissimilar measures should be “low”. In this study, measures of

constructs that theoretically should be related to each other are, in fact, observed to be related to each other. Thus, the measurement model proves to be unidimensional and reliable, and indicates convergent and discriminant validity. This means that all remaining factors show that there is a relation between the remaining seven factors and the intention to use Internet banking services in Bahrain. So, the following hypotheses are satisfied: H1, H2, H3, H4, H5, H6 and H7 are satisfied.

H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain.

H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain.

H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain.

H4 – Increased information quality reduces the barrier of perceived ease of use which positively affects the intention to use Internet banking services in Bahrain.

H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain.

H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain.

H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain.

Thus, the equation should be: Attitudes towards e-banking security = Increased privacy protection + Increased security protection + Increased trust of online banking services + Increased information quality + Reduced risks and increased benefits of online banking services + Adherence to certain dimensions of culture + Increased usage of biometrics.

Afterwards, it is better to find out what the effect of CD and BT is on the intention to use Internet banking services in Bahrain as explained by PPP, PSP, PT, PIQ and PRB. To do this a path analysis is needed.

5.15 Path Analysis

Since it is certain that all constructs have been measured properly, the co-variance arrows from Figure 5.1 should be removed and the model in Figure 5.3 is tested.

Primarily, we examine the fit solution. As shown in the below Tables 5.40, 5.41, 5.42, 5.43, 5.44 and 5.45, we find that the chi-square value is 3201.945 with a p-value of 0.075 >0.05, and the null hypothesis that the co-variance matrix generated by the model is equal to the observed co-variance matrix cannot be rejected. Since GFI = 0.985 >0.90, AGFI = 0.834 >0.80, TLI = 0.982 >0.90 and RMSEA = 0.043 <0.05, then the model is a qualitatively good one. Moreover, in Tables 5.44 and Table 5.45 (Appendix B), the unstandardised and standardised regression coefficients are shown. In these tables, BT appears to have a

significant influence on all of PSP, PT, PIQ and PRB (CR or t-values are 8.733, 22.771, 14.135 and 13.721 respectively greater than 1.96 in absolute value, and all have a significance less than 0.001 since p-value = 0.000). So the null hypothesis that the path coefficient is equal to zero is rejected every time (which means that the effect exists). Moreover, the effect of BT on PSP, PT, PIQ and PRB is positive (correlation = 0.289, 0.977, 0.944 and 0.544 respectively). This result is also logical since the variables go in the same direction. On the other hand, the effect of BT appears to have no significant influence on PPP (CR or t-values is -1.836 which is less than 1.96 in absolute value, and has a significance greater than 0.001 since p-value = 0.066). So the null hypothesis that the path coefficient is equal to zero is not rejected every time (which means that the effect does not exist). Moreover, the effect of BT on PPP is very weak and negative (correlation = -0.030).

Table 5.40 CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	162	3201.945	789	.075	8.439
Saturated model	980	.000	0		
Independence model	78	7352.867	795	.000	26.586

Table 5.41 RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.094	.985	.834	.563
Saturated model	.000	1.000		
Independence model	0.454	.027	-.030	.045

Table 5.42 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.919	.904	.976	.982	.954
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table 5.43 RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.043	.000	.058	.540
Independence model	.434	.442	.446	.000

Table 5.44 Regression Weights (Group number 1 – Default Model)

			Estimate	S.E.	C.R.	P	Label
X1	<---	X6	-.033	.018	-1.836	.066	par_70
X2	<---	X6	.084	.010	8.773	***	par_71
X3	<---	X6	1.120	.049	22.771	***	par_72
X1	<---	X7	1.060	.044	24.065	***	par_73
X2	<---	X7	.270	.023	11.537	***	par_74
X3	<---	X7	.221	.025	8.707	***	par_75
X4	<---	X6	.551	.039	14.135	***	par_76
X4	<---	X7	.213	.017	12.629	***	par_77
X5	<---	X6	.444	.032	13.721	***	par_78
X5	<---	X7	.667	.046	14.371	***	par_79
PPP1	<---	X1	1.000				
PPP2	<---	X1	.981	.034	28.435	***	par_1
PPP3	<---	X1	.689	.046	15.069	***	par_2
PPP4	<---	X1	.689	.052	13.302	***	par_3
PPP5	<---	X1	.842	.033	25.156	***	par_4
PPP6	<---	X1	.494	.042	11.667	***	par_5
PPP7	<---	X1	.901	.077	11.677	***	par_6
PPP8	<---	X1	.930	.037	25.272	***	par_7
PPP9	<---	X1	.946	.033	28.525	***	par_8
PSP1	<---	X2	1.000				
PSP2	<---	X2	1.989	.213	9.357	***	par_9
PSP3	<---	X2	1.035	.133	7.779	***	par_10
PSP4	<---	X2	1.704	.208	8.187	***	par_11
PSP5	<---	X2	1.181	.142	8.293	***	par_12
PSP6	<---	X2	3.176	.333	9.551	***	par_13
PSP7	<---	X2	2.848	.282	10.103	***	par_14
PSP8	<---	X2	2.783	.249	11.163	***	par_15
PSP9	<---	X2	2.155	.236	9.128	***	par_16
PSP10	<---	X2	3.173	.395	8.028	***	par_17
PT1	<---	X3	1.000				
PT2	<---	X3	.909	.035	26.325	***	par_18
PT3	<---	X3	.823	.049	16.734	***	par_19
PT4	<---	X3	.476	.048	9.930	***	par_20
PT5	<---	X3	.499	.051	9.693	***	par_21
PT6	<---	X3	.930	.042	21.992	***	par_22
BT7	<---	X6	1.000				
BT6	<---	X6	1.197	.046	25.761	***	par_23
BT5	<---	X6	1.173	.046	25.235	***	par_24
BT4	<---	X6	1.032	.057	18.240	***	par_25
BT3	<---	X6	.700	.069	10.215	***	par_26
BT2	<---	X6	.948	.070	13.595	***	par_27
BT1	<---	X6	.869	.062	14.059	***	par_28
CD15	<---	X7	1.000				
CD14	<---	X7	.870	.078	11.179	***	par_29
CD13	<---	X7	.971	.033	29.010	***	par_30
CD12	<---	X7	.996	.035	28.322	***	par_31
CD11	<---	X7	1.045	.034	30.311	***	par_32
CD10	<---	X7	1.062	.037	28.455	***	par_33
CD9	<---	X7	.929	.041	22.901	***	par_34
CD8	<---	X7	1.027	.034	30.051	***	par_35
CD7	<---	X7	1.153	.049	23.644	***	par_36
CD6	<---	X7	1.048	.035	29.802	***	par_37
CD5	<---	X7	1.199	.057	21.106	***	par_38
CD4	<---	X7	1.062	.034	30.948	***	par_39
CD3	<---	X7	1.114	.056	19.869	***	par_40
CD2	<---	X7	1.094	.036	30.321	***	par_41
CD1	<---	X7	.967	.034	28.519	***	par_42
CD16	<---	X7	1.239	.050	24.857	***	par_43
CD17	<---	X7	.941	.036	25.831	***	par_44
CD18	<---	X7	.954	.046	20.889	***	par_45
CD19	<---	X7	.940	.046	20.375	***	par_46
CD20	<---	X7	.943	.047	19.922	***	par_47
PRB15	<---	X5	1.000				
PRB14	<---	X5	.781	.074	10.499	***	par_48
PRB13	<---	X5	.614	.077	7.958	***	par_49
PRB12	<---	X5	1.123	.083	13.538	***	par_50
PRB11	<---	X5	.640	.063	10.220	***	par_51
PRB10	<---	X5	.925	.071	13.015	***	par_52
PRB9	<---	X5	.665	.067	9.912	***	par_53
PRB8	<---	X5	1.030	.076	13.540	***	par_54
PRB7	<---	X5	.702	.063	11.065	***	par_55
PRB6	<---	X5	.703	.063	11.108	***	par_56
PRB5	<---	X5	1.138	.083	13.742	***	par_57
PRB4	<---	X5	1.040	.083	12.488	***	par_58
PRB3	<---	X5	.853	.109	7.861	***	par_59
PRB2	<---	X5	.813	.111	7.300	***	par_60
PRB1	<---	X5	1.155	.099	11.612	***	par_61
PRB16	<---	X5	.760	.068	11.197	***	par_62
PRB17	<---	X5	.278	.038	7.286	***	par_63
PRB18	<---	X5	.270	.038	7.099	***	par_64
PIQ6	<---	X4	1.000				
PIQ5	<---	X4	1.630	.127	12.798	***	par_65
PIQ4	<---	X4	1.475	.131	11.250	***	par_66
PIQ3	<---	X4	1.232	.128	9.590	***	par_67
PIQ2	<---	X4	1.325	.148	8.967	***	par_68
PIQ1	<---	X4	1.698	.137	12.411	***	par_69

Table 5.45 Standardised Regression Weights (Group Number 1 – Default Model)

			Estimate
X1	<---	X6	-.030
X2	<---	X6	.289
X3	<---	X6	.977
X1	<---	X7	.995
X2	<---	X7	.956
X3	<---	X7	.199
X4	<---	X6	.944
X4	<---	X7	.375
X5	<---	X6	.544
X5	<---	X7	.843
PPP1	<---	X1	.969
PPP2	<---	X1	.990
PPP3	<---	X1	.899
PPP4	<---	X1	.869
PPP5	<---	X1	.979
PPP6	<---	X1	.833
PPP7	<---	X1	.834
PPP8	<---	X1	.979
PPP9	<---	X1	.990
PSP1	<---	X2	.826
PSP2	<---	X2	.871
PSP3	<---	X2	.774
PSP4	<---	X2	.801
PSP5	<---	X2	.808
PSP6	<---	X2	.882
PSP7	<---	X2	.910
PSP8	<---	X2	.960
PSP9	<---	X2	.858
PSP10	<---	X2	.790
PT1	<---	X3	.972
PT2	<---	X3	.981
PT3	<---	X3	.918
PT4	<---	X3	.782
PT5	<---	X3	.774
PT6	<---	X3	.961
BT7	<---	X6	.968
BT6	<---	X6	.982
BT5	<---	X6	.980
BT4	<---	X6	.937
BT3	<---	X6	.793

			Estimate
BT2	<---	X6	.875
BT1	<---	X6	.884
CD15	<---	X7	.979
CD14	<---	X7	.815
CD13	<---	X7	.982
CD12	<---	X7	.980
CD11	<---	X7	.985
CD10	<---	X7	.980
CD9	<---	X7	.959
CD8	<---	X7	.984
CD7	<---	X7	.963
CD6	<---	X7	.984
CD5	<---	X7	.949
CD4	<---	X7	.986
CD3	<---	X7	.941
CD2	<---	X7	.985
CD1	<---	X7	.980
CD16	<---	X7	.968
CD17	<---	X7	.972
CD18	<---	X7	.948
CD19	<---	X7	.944
CD20	<---	X7	.941
PRB15	<---	X5	.879
PRB14	<---	X5	.864
PRB13	<---	X5	.744
PRB12	<---	X5	.959
PRB11	<---	X5	.853
PRB10	<---	X5	.946
PRB9	<---	X5	.840
PRB8	<---	X5	.959
PRB7	<---	X5	.885
PRB6	<---	X5	.887
PRB5	<---	X5	.964
PRB4	<---	X5	.931
PRB3	<---	X5	.738
PRB2	<---	X5	.704
PRB1	<---	X5	.904
PRB16	<---	X5	.890
PRB17	<---	X5	.704
PRB18	<---	X5	.692

			Estimate
PIQ6	<---	X4	.868
PIQ5	<---	X4	.946
PIQ4	<---	X4	.894
PIQ3	<---	X4	.823
PIQ2	<---	X4	.792
PIQ1	<---	X4	.934

The following sub-hypotheses of biometric technology are as follows:

H7a – BT has significant positive influence on perceived privacy protection (PPP): Not supported

H7b – BT has significant positive influence on perceived security protection (PSP): Supported

H7c – BT has significant positive influence on perceived trust (PT): Supported

H7d – BT has significant positive influence on perceived information quality (PIQ): Supported

H7e – BT has significant positive influence on perceived risks and benefits (PRB): Supported

In addition, in Table 5.44 and Table 5.45, CD appears to have a significant influence on all of PPP, PSP, PT, PIQ and PRB (CR or t-values are 24.065, 11.537, 8.707, 14.135 and 14.371 respectively greater than 1.96 in absolute value, and all have a significance less than 0.001 since p-value = 0.000). So the null hypothesis that the path coefficient is equal to zero is rejected every time (which means that the effect exists). Moreover, the effect of CD on PPP, PSP, PT, PIQ and PRB is positive (correlation = 0.995, 0.956, 0.199, 0.375 and 0.843 respectively). Finally, Figure 5.3 represents the path diagram which also supports the previous discussion.

The five sub-hypotheses on cultural dimensions are supported:

H6a – Cultural dimension has significant positive influence on perceived privacy protection (PPP): Supported

H6b – Cultural dimension has significant positive influence on perceived security protection (PSP): Supported

H6c – Cultural dimension has significant positive influence on perceived trust (PT): Supported

H6d – Cultural dimension has significant positive influence on perceived information quality (PIQ): Supported

H6e – Cultural dimension has significant positive influence on perceived risks and benefits (PRB): Supported

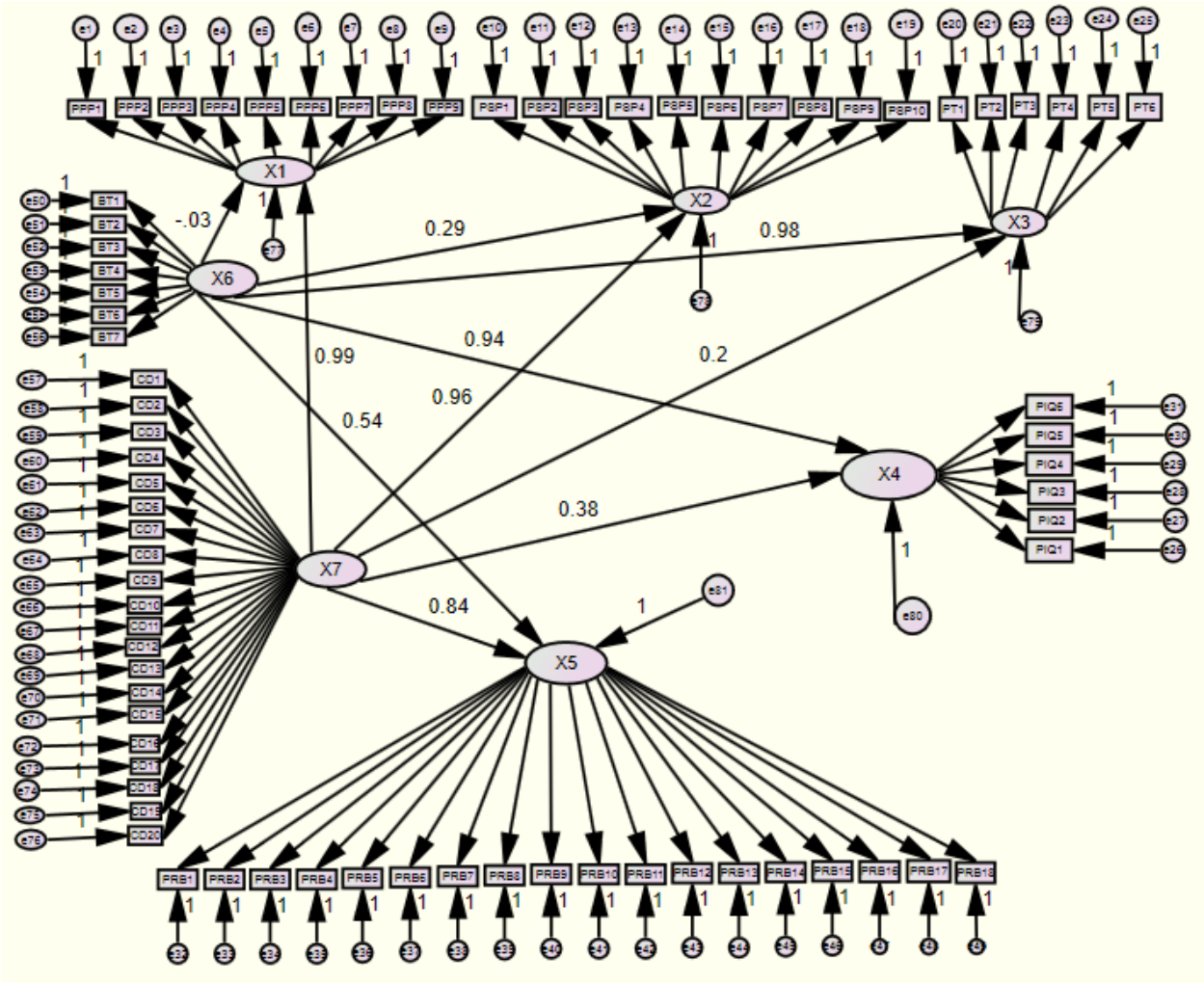

Figure 5.3 Path Diagram

5.16 Discussions of Findings

The following sections individually address the research questions and verify the hypotheses using the findings discussed in the previous chapter.

5.16.1 The Demographic Profile of the Respondents

The results of the survey revealed that 30% of the respondents were dominated by the 24-34 year-old age group, where 62% of the respondents were males; the majority (or 62%) of whom were employees. The output of the study also revealed that in terms of education, 46% were bachelor's degree holders while 24% are master's degree holders.

These findings indicated that, in general, the bank customers were represented by the young professional age group, the majority of whom were males and highly educated. Bahrain is considered one of the most developed education systems in the Gulf which has recently made strong advances in the use of information technology in schools (MOE, 2013).

The above findings were supported by Munussamy et al. (2013) in their study on the adoption by consumers of retail Internet banking in which it was revealed that the hypotheses pertaining to gender, race, income, educational level and occupation on the use of Internet banking were not supported, except age. This finding indicated that the age of bank customers affects the adoption of Internet banking which reflects the same trend in the current study. The results also suggest that consumers in the age group below 25 years old are more likely to adopt Internet banking.

With respect to the background information regarding the use of the Internet, 48% of the participants revealed that they use it very often (several times a day) while 27% use the Internet often (once a day). This finding implies that in general, bank customers are heavy users of the Internet since most of them are using it several times a day. When asked about the reasons why they use the Internet, 49% of the respondents said they want to: “Keep in touch with friends and relatives (social media/Facebook)”. However, 16% said they want to search for information. Interestingly, a minority (12%) said they use it for banking services.

The above findings were in accord with the study of Sarmad and Awadhi (2012) who discussed the outcomes of different metrics profiles of Internet usage in the Kingdom of Bahrain. Their study revealed that daily access to the Internet is 90% of total respondents, Internet access from the workplace is 39%, and over 90% of all computer users have used the Internet for more than six years. Likewise, the 13th edition of The Global Information Technology Report (2014) revealed that Bahrain is one of the countries which has been singled out by the World Economic Forum for their ability to use information and communications technology (ICT). The same report showed Bahrain ranked 29th in the Networked Readiness Index (NRI) supported by affordable ICT access (25th), and uptake by individuals is considered as one of the best in the world (14th), with a very high number of Internet users (The Global Information Technology Report, 2014).

5.17 Mean Averages of Factors Affecting the Adoption of Internet Banking

5.17.1 Perceptions of Respondents with Respect to Privacy Concerns

From the eight items provided to measure the perceptions of respondents with respect to privacy concerns on online services based on the five-point Likert scaling method, the respondents showed negative responses to the statements: “Keeping in touch with friends and relatives”, “work” and “banking”. These findings denote that the respondents are concerned about their privacy when dealing with social, banking and work activities. Privacy concerns are identified as one of the main factors that have a negative impact on Internet users’ online behaviour. Most often, Internet users do not have confidence that a website will ensure their privacy either in collection of, or in future usage of, their personal information.

The above findings were supported by the ideas of Pope and Lowen (2009) who said that the growth of the Internet has increased concerns over privacy because of the perceived increase in vulnerability of information. To support this, the Bank Secrecy Act (BSA) was enacted in the US to keep information about the client’s bank relationships and financial transactions secret (Horn and Kellye, 2006). However, with the use of the Internet, consumers show great concern about how

personal information is so easily collected, stored, processed and utilised. Users of ubiquitous computing have sometimes realised they are actually customers of firms that collect personal information for dubious purposes which has led consumers to become deeply interested in the topic of information privacy (Pavlou, 2011).

5.17.2 Perceptions of the Security of the Internet

From the five items presented about the security of devices used to access the Internet, on a five-point Likert scale ranging from “Very secure” to “Not always secure”, the respondents have shown positive perceptions of the security of smart phones, computers, laptops and tablets/PDAs. However, they believed that mobile phones were not very secure. These findings suggest that all devices are perceived to be “secure” except mobile phones.

Likewise, notably among these issues is the overriding concern about security. In fact, organisations give weight to this problem in their marketing messages. Regardless of whether an organisation has experience in deploying transactions via mobile applications, authentication is seen as a prime challenge to resolving security issues.

When it comes to security, most mobile devices are a target waiting to be attacked. This is the conclusion of a report to Congress on the status of the security of mobile devices watchdogs at the Government Accountability Office of

the US (Cooney, 2012). The GAO indicated that: “Mobile devices face an array of threats that take advantage of numerous vulnerabilities which can be the result of inadequate technical controls, but they can also result from the poor security practices of consumers” (Cooney, 2012).

Extant literature mentioned that security is a major concern that contributes to an individual’s desire to adopt online services. However, due to some security issues ranging from privacy disclosure to financial loss, individuals’ willingness to apply for online services may be lessened (Chorng-Shyong Ong, 2015). Concerns about security and privacy were identified by McCloskey (2006) as barriers to the use of electronic innovations, while Zhao et al. (2010:8) argued that data security is a major issue for businesses, public bodies and consumers.

These findings were supported by Chang and Ho (2006, p.346) who recommended setting a tight security policy on the Internet so as to minimise organisational risk. Likewise, Hong et al. (2003) pointed out that the goal of information security is to ensure the confidentiality of information within the system, and to provide methods for establishing and maintaining the integrity of information as well as the availability of information processing resources.

5.17.3 Devices Used to Access the Services on the Internet

From the five items presented to establish the perceptions of the respondents on “Devices used to access the Internet”, the respondents revealed that when searching for information, social media and news, they always use a computer/laptop. Likewise, they also use the aforementioned technological gizmos “very often” when accessing banking services. However, they use mobile phones and iPads when accessing social media and news. Interestingly, in terms of banking services, the respondents use computers/laptops and tablets/iPads, “very often”. These findings suggest that, from the respondents’ points of view, computers and laptops, tablets and iPads are much easier, secure and accessible to use when accessing banking services on the World Wide Web.

Mobile devices often do not limit Internet connections. Moreover, many mobile devices do not have firewalls to limit connections. When the device is connected to a wide area network it uses communications ports to connect with other devices and the Internet. A hacker could access the mobile device through a port that is not secured. A firewall secures these ports and allows the user to choose what connections he wants to allow into the mobile device. Without a firewall, the mobile device may be open to intrusion through an unsecured communications port, and an intruder may be able to obtain sensitive information on the device and misuse it (Cooney, 2012).

These findings support the idea that, when it comes to security, most mobile devices are a target waiting to be attacked. This is the conclusion of a report to Congress on the status of the security of mobile devices watchdogs at the Government Accountability Office of the US (Cooney, 2012). The GAO indicated that "Mobile devices face an array of threats that take advantage of numerous vulnerabilities which can be the result of inadequate technical controls, but they can also result from the poor security practices of consumers," (Cooney, 2012). Likewise, notably among these issues is the overriding concern about security. In fact, organisations give weight to this problem in their marketing messages. Regardless of whether an organisation has experience in deploying transactions via mobile applications, authentication is seen as a prime challenge to resolving security issues.

5.18 Perception of Respondents of Factors Affecting the Adoption of Internet Banking

This section aims to establish the perception of respondents of factors affecting the adoption of Internet banking by using the five-point Likert scaling method ranging from “strongly agree” to “strongly disagree”. The following constructs were measured: perceived privacy protection (PPP), perceived security (PS), perceived trust (PT), perceived information quality (PIQ), perceived risks and benefits (PRB), cultural dimensions (CD) and biometric technology (BT).

5.18.1 Perceived Privacy Protection

The first dimension refers to perceived privacy protection which was measured by using the five-point Likert scaling method of which nine items were used. It was noted that from the perspectives of the respondents, they were concerned about “too much personal information being collected when they use online banking”, verbally interpreted as “strongly agree”. The findings revealed that respondents were concerned about how their personal information is collected when using online banking activities.

Extant literature revealed that the single greatest factor influencing online purchase behaviour is a concern over control of private information. Likewise, it can be assumed that conducting banking transactions online will raise similar questions about privacy risk (Pope and Lowen, 2009; McCole et al., 2010). According to Pavlov (2011), with the use of the Internet, consumers show great concerns about how personal information is so easily collected, stored, processed and utilised. Sometimes, there are actually customers of firms that collect personal information for dubious purposes which has led consumers to become deeply interested in the topic of information privacy.

One of the reasons why online customers avoid performing online financial transactions is the threat of information privacy which pushes them away from providing personal and sensitive information (Wang et al., 2003). From a privacy standpoint, trust can be viewed as the customer’s expectation that an online

business will treat the customer's information fairly (Omariba, 2012), and that privacy is the most important determinant of consumer confidence (Mukherjee and Nath, 2007). Thus, any feelings of trust created or developed in the customer's view of the business can ease privacy concerns, which in turn will promote the sharing of personal information, and facilitate the completion of a transaction (Lee and Cranage, 2011). According to Hong and Thong (2013) online customers felt the release of personal information to be important in their interaction with websites, however, they had little control over how their information would be managed once released. Customers are more willing to release personal information if they feel they will have control over the management of their information.

5.18.2 Perceived Security Protection

In terms of perceived security protection, the results revealed that the lowest mean was on item: "Security features are important to them when choosing Internet banking", 1.29, strongly agree. The respondents showed positive responses to the following statements: "Security features are important to me when choosing Internet banking"; "My bank implements security measures to protect me when I use online banking"; and "My bank provides a secure service when I use Internet banking". These findings indicate that in terms of security, the participants are confident that the banks implement safety measures to secure

online transactions. The findings imply also that to perceive security protection has a significant relationship with Internet banking adoption.

These findings were supported by the studies of Ong (2015), Zhao et al. (2010), Chang and Ho (2006) and Gorman (2007:563), who emphasised that perceived security is an important factor that influences individuals' Internet banking adoption. Due to security issues ranging from privacy disclosure to financial loss, individuals whose willingness to apply for an online service may be lessened (Chorng-Shyong Ong, 2015). On the other hand, Zhao et al. (2010:8) argued that most banks recognise that information, and systems supporting the information, are important assets for establishing and leveraging information-based resources and competence, especially for Internet banking in order to improve a bank's competitive edge within the sector. These studies suggest that security is an identified factor in customer decision making about whether to use Internet banking.

The above findings support the ideas of Haque et al. (2009) who conveyed that only protected transactions have significant impact on consumers' perception about e-banking security. The authors recommend that banks need more publicity about the security level and rules and regulations related to security. Non-availability or lack of such information to the potential customers may have intensified the psychological fear and anguish. While there is a possibility of fraud cases to occur through the use of e-banking, financial institutions should protect

their customers by incorporating effective technology tools and motivational messages that reflect a full guarantee to protect their personal information. Further protection can be in the form of investigation and appropriate compensation procedures.

5.18.3 Perceived Trust of Online Banking Services

It was interesting to note that the highest mean on this dimension was reflected in the statement: “Overall, I trust my bank to provide me with secure online banking services”, 4.09 interpreted as “disagree”. Moreover, five other statements were given “undecided” ratings by the respondents: “Overall, I trust my bank to provide me with secure online banking services”, 2.6; “I would never use online banking services because I don’t trust my bank to provide a secure service”, 3.0; “I would never use online banking services because the Internet is not secure”, 2.48. These findings imply that there was an issue of trust regarding online banking services as perceived by the respondents who answered negatively to the statement: “Overall, I trust my bank to provide me with secure online banking services”.

The above findings bear relevance to the study of Yousafzai et al. (2007) who points out that customers’ trust in Internet banking transactions has some unique dimensions and that there are concerns about its reliability and the extensive media coverage about frauds committed on the Internet. Trust is vital in online transactions because of the risk and uncertainty associated with the services and

lack of physical presence of the parties involved in the transaction. Trust, together with the economic values and perceived risks are strong factors that determine the behaviour of online customers (Azam and Qiang, 2012). The existence of legal regulation increases trust and the legal regulation of banking activity is important to protect both the customer and the bank.

The above ideas were supported by Popoola (2013) who revealed that bank customers who are non-users of Internet banking lack trust in Internet banking and the users of Internet banking have partial trust in it which is rooted from a lack of security, bad reputation of banks, poor technology and lack of assuring policy or guarantee. Likewise, Olasanmi (2010) conveyed that trust and fear have an effect on Internet banking consumers who are victims of fraudulent activities on the Internet. A low level of trust tends to inhibit the adoption of Internet banking: because there is no face-to-face interaction when taking an online transaction, the transmitting of private data and financial details, which is open to abuse, demands a high level of consumer confidence.

The findings above bear significance to the study of McCole et al. (2010) who pointed out that trust in e-business also incorporates the notion of trust in the infrastructure and the underlying control mechanism (technology trust) which deals with transaction integrity, authentication, confidentiality and non-repudiation. McCole et al. identified three factors of how human trust depends on an automated or computerised system: (1) The perceived technical competence

of the system; (2) The perceived performance level of the system; (3) The human operator's understanding of the underlying characteristics and processes governing the system's behaviour. These factors relate to the perceived ability of the Internet to perform the task it is supposed to, as well as the speed, reliability and availability of the system. It might also extend to whether one has a broad knowledge or appreciation of the World Wide Web.

5.18.4 Perceived Information Quality

In terms of perceived information quality, four out of six items were agreed upon by the respondents in which the lowest mean was found on the item: "The information provided by my bank for online banking is useful", 2.17. Interestingly, two statements were given "undecided" remarks by the respondents: "The information provided by my bank for online banking is complete" and "My bank provides enough information to convince me that online banking is safe". These findings imply that the respondents have conflicting ideas about the completeness, reliability and the quality of information provided by the banks under study. By casting doubt on the completeness of information means there is a gap between what is communicated to consumers and what is actually delivered.

The above findings were supported by the ideas of Davidson (2005) who points out that "information gap" is the difference between customers' website requirements and managements' beliefs about those requirements. This gap,

acccording to Davidson, usually occurs when there is a lack of timely, accurate information which hinders the managers, policy makers and market participants to develop effective responses. To close this gap, empathic listening to customers and strengthening the relationship by understanding and meeting their needs over time are needed.

On the other hand, Harold (2012) suggests that information quality has positive effects on banking success. Likewise, Wang and Pho (2009), in their study using a research framework based on the DeLone and McLean (2003) Information System success, revealed that website information quality depends on delivering relevant, updated and easy-to-understand information to significantly influence the attitude, satisfaction and purchase/use of bank online services. The authors pointed out that information quality can be measured using information relevance, currency and understandability.

5.18.5 Perceived Risk and Benefits of the Adoption of Internet Banking

In terms of the perceived risks and benefits of the adoption of Internet banking, almost all items were agreed upon by the respondents. The lowest mean was found in the statement: “The risk of not being able to get a good quality service using online banking is higher than conventional face-to-face banking” and seconded by: “The risk of fraud using Internet banking is higher than conventional face-to-face banking”. These findings revealed that the participants

viewed the adoption of Internet banking as riskier than conventional banking. However, they believe that online banking security could be improved by using biometric technology.

The above findings were supported by Zhao et al. (2010) who said perceived risks associated with security and privacy and the relationship between trusts are important influences on customer adoption of Internet banking. Likewise, Cristobal et al. (2007) imparted that a low level of trust tends to inhibit the adoption of Internet banking: because there is no face-to-face interaction when conducting an online transaction, the transmitting of private data and financial details, which is open to abuse, demands a high level of consumer trust. Furthermore, Yoon and Occena (2014) found that both security concerns and usability have significant effects on Internet banking use with a smart phone. From the findings, the study supports the idea that benefits are often accompanied with risk.

5.19 The Preference of Respondents of the Appropriate Biometric Technologies Needed in Internet Banking

In terms of biometric technology to be considered for authenticating the customer, the findings showed that it would have been better to have a fingerprint recognition reader – automated biometric scanner to authenticate the fingerprint of the individual. However, the respondents disagreed on two items, digital signature and hand recognition.

The above findings were supported by the ideas of Nasir and Yunos (2005) who imparted that easy access and convenience of Internet banking should not be at the expense and mercy of the security of information. The authors explained that for better security, a three-factor authentication process should be considered with the use of biometric technology such as iris or thumbprint recognition.

Moreover, Sarma and Singh (2010) stressed that biometric technology is also one of the most important technologies for risk management as well as security factors of Internet banking. The London-based consultants Goode Intelligence predicted that some 450 million bank customers globally will use biometrics, which will be the principal banking authentication method by 2020 (Umico, 2015). It was also portrayed in the report that biometrics in banking is already a maturing industry with many successful implementations around the world but there is a related issue of public acceptance. Although biometrics has its advantages, there may be a generally prevalent perception that biometrics are a threat to the privacy of an individual (Sharma and Singh, 2010).

5.20 Hofstede's Five Dimensions of Cultural Values at the Individual Level to Validate the Barriers towards the Adoption of Internet Banking

This section deals with the perceptions of cultural dimensions that may affect the Internet adoption of banking services among participants. The statements were

based on Hofstede's (1980) cultural dimensions which are based on five dimensions of culture from an extensive survey at IBM.

The first dimension deals with power distance which measures the way in which different cultures approach and accept inequalities between individuals of a society. All statements in power distance dimensions were "agreed" upon by the respondents. The lowest mean was reflected in the statement: "People in lower positions should not disagree with decisions by people in higher positions", with a mean average of 2.22. This was followed by: "People in higher positions should make most decisions without consulting people in lower positions", 2.3 and "People in higher positions should not ask the opinions of people in lower positions too frequently", 2.33.

This study supports the findings of Phan et al. (2002) and Png et al. (2001) who found out that cultures with high power distance lacked the enthusiasm to adopt information systems, in this case, Internet banking in the Kingdom of Bahrain. According to Hofstede, a typical high score for this dimension characterised a culture with a paternalistic decision-making style where the employee or the subordinate is afraid to manifest his disagreement with the superior and is rather glad to accept his superior's decisions. Li et al. (2009) point out that in technology usage, high power distance users pay more attention to the community's reaction to the technology, and then alter their reaction, relying on

their place within the hierarchical structure. However, low power distance users are more self-governing in their technology use.

The next dimension is uncertainty avoidance. The lowest mean was found in the statement: “Standardised work procedures are helpful”, 1.93, interpreted as “agree”. All other statements were agreed upon by the respondents: “It is important to have instructions spelled out in detail so that I always know what I’m expected to do”, 2.34; “It is important to closely follow instructions and procedures”, 2.35; “Rules and regulations are important because they inform me of what is expected of me”, 2.12; Instructions for operations are important”, 2.37, interpreted as “agree”. The findings reflect high uncertainty avoidance culture among participants.

According to Hosftede, uncertainty avoidance is the extent to which a culture programmes its members to feel either uncomfortable or comfortable, in unstructured situations. Unstructured situations are novel, unknown, surprising or different from usual (Wei et al., 2008). In high uncertainty avoidance cultures, users have a low tolerance of the unknown and risk. When high uncertainty avoidance users do not avoid ambiguous situations, they will seek easy rules, in order to decrease the ambiguity. Generally, high uncertainty avoidance users are expected to comply with their community beliefs more when adopting technology; the opposite is true for low uncertainty avoidance culture users (Li et al., 2009).

Bahrain, which is a part of the Arab culture, scores 68 on this dimension and thus has a high preference for avoiding uncertainty. The literature suggests that higher uncertainty avoidance would influence the adoption of information systems (IS) negatively. Although literature rating the Arab Gulf region is also high on uncertainty avoidance, there exists an extensive IS adoption. The Arab culture scores 68 on this dimension and thus has a high preference for avoiding uncertainty.

The third dimension is individualism versus collectivism**.** All statements were "agreed" upon by the participants in this dimension, with the lowest mean in the statement: "Individuals should only pursue their goals after considering the welfare of the group", 2.05. "Group welfare is more important than individual rewards", 2.06, interpreted as "agree". Other statements approved by the participants were: "Individuals should stick with the group even through difficulties", 2.2. However, two statements were given undecided remarks by the respondents: "Group loyalty should be encouraged even if individual goals suffer", 2.51; and "Group success is more important than individual success", 3.48. The findings reflect that the collectivist culture is apparent among participants.

In this dimension of culture, individuals are supposed to look after themselves or remain integrated into groups and family (Wei et al., 2008). In high collectivist cultures, users have a tendency to focus more on the community to which they

belong. They are more impacted by their peers and superiors, by satisfying their opinions, however, the opposite occurs in individualistic cultures. In technology adoption and use, high collectivism users care more about regarding how their community is possibly affected by their adoption behaviours (Li et al., 2009). This dimension is meant to assess the role of the individual and of the group in a given society.

The findings support Hofstede's cultural dimension on low individualism (IDV) where in technology adoption and use, high collectivism users care more about regarding how their community is possibly affected by their adoption behaviours (Li et al., 2009). This was reflected in their strong agreement on psychological and technical barriers on Internet banking adoption: "Hinders social relations" and "Insufficient help desk information when something goes wrong during Internet transactions".

Bahrain is considered a collectivistic society with its Arabic origin. This is manifested in a close long-term commitment to the member "group", be that a family, extended family or extended relationships. At this point "wasta" is part of its culture with its historic issues towards decision making and not being influenced by surroundings. In the Arab world "wasta" means deep connections of kin with an obligation to provide a pervasive foundation for important decisions and information sharing (Hutchings and Weir, 2006). It was found that in China "wasta" is called "guanxi"; therefore nepotism and cronyism are all types of social

networks that influence the distribution of advantages and resources amongst people in China. Both Arab “wasta” and Chinese “guanxi” play critical roles in their respective societies (Mohamed and Mohamed, 2011:413).

“Wasta” conveys a meaning of “middle” or someone who acts as a go-between. As an intermediary, a “wasta” must be someone with influence (in order to secure the favour). This means the person as go-between is not necessarily a relative or even a close friend but quite possibly just a passing acquaintance or sometimes a complete stranger. By using his influence to perform a service, the “wasta” acquires prestige and honour but, perhaps more importantly, the person receiving the favour incurs a debt of gratitude, which may have to be repaid in unspecified ways at some point in the future. The origins of “wasta” are by no means disreputable. It has a long and generally respectable history as a way of managing relations between families, clans or tribes through intermediaries (Books, 2009). Since the use of “wasta” in Bahrain is a common practice Internet banking diffusion is low because it might affect the social relations of users who happened to have relationships with bank personnel or employees.

The last dimension reflects masculinity versus femininity. In this dimension, the degree to which tough values, such as assertiveness, performance, success and competition (which are associated with the role of men) prevail over tender values, such as quality of life, maintaining warm personal relationships, service, care for the weak and solidarity (associated with women’s roles) (Wei et al.,

2008). It could be noted that the lowest mean was reflected in the statement: “It is more important for men to have a professional career than it is for women”, 1.9, interpreted as “agree”. All other statements agreed upon by the participants were: “Men usually solve problems with logical analysis; women usually solve problems with intuition”, 2.153; and “Solving difficult problems usually requires an active, forcible approach, which is typical of men”, 2.16; “There are some jobs that a man can always do better than a woman”, 2.14. The findings reveal that participants tend to agree with a masculine culture.

In using technology, feminine users usually care more about building relationships with other users than the technology itself. They focus on maintaining interdependency and accepting others’ suggestions and desires. Users with feminine values are expected to conform to social pressures more than those with highly masculine values (Li et al., 2009). The Arab world scores 52 on this dimension, thus being a masculine society. This finding implies that although Bahrain is, generally, a masculine society as a result of their Arab culture, adoption of technology reveals their feminine values which they said “hinder social relations”.

The current findings support the Arab world findings which reflect PDI, IDV, MAS and UAI. Hofstede has identified large PDI (80) and UAI (68) for the Arab world where the society is highly rule-oriented, risk averse and does not readily accept change. Hierarchy in an organisation is seen as reflecting inherent inequalities.

The Arab world has a high preference for avoiding uncertainty. This type of culture maintains rigid codes of belief and behaviour and is intolerant of unorthodox behaviour and ideas. In these cultures there is an emotional need for rules (even if the rules never seem to work). Moreover, innovation may be resisted, and security is an important element in individual motivation. Furthermore, according to Hofstede, the high MAS index (52) may be more a result of the Muslim religion than culture. In masculine countries people “live in order to work”. Finally, the relatively low IDV (38) indicates a society where loyalty and close long-term commitment to groups such as family is paramount. This is manifested in a close long-term commitment to the member “group”, be that a family, extended family or extended relationships. Loyalty in a collectivist culture is paramount, and overrides most other societal rules and regulations. Thus, it could be inferred that cultural dimensions have significant relationships with Internet banking adoption.

5.21 Results of the Reliability Statistics

In this study, the Cronbach's alpha was computed and the results were compared with the 0.7 level recommended as a cut-off point, which showed that scales were reliable (Nunnally and Bernstein, 1994). In order to have a meaningful data understanding reliability and validity of the measures, theoretical constructs and estimation of the relationships among these constructs which the Cronbach's Alpha average at .837 that support the perceived privacy protection (PPP) variables; .855 that support the perceived security protection (PSP) variables; .777 that support the perceived trust (PT) variables; .749 that support the perceived information quality (PIQ) variables; .889 that support the perceived risks and benefits (PRB) variables; .878 that support the cultural dimensions (CD) variables: and .714 that support the biometric technology (BT) variables. As shown in the literature, Cronbach's alpha is an index of reliability associated with the variation accounted for by the true score of the "underlying construct", which refers to the hypothetical variable that is being measured (Hatcher, 1994).

5.22 Testing the Reliable Model

The model constructs of the major variables were purified and tested based on the point of view of the customer respondents. The results of the normality of data were tested using the skewness and kurtosis. In this model, variable PSP9 fell outside the acceptable range for values of skewness and kurtosis (skewness value = 8.469 >2 and kurtosis value = 103.563 >3); moreover, the kurtosis value of perceived risks and benefits (PRB3) is 3.525 that also fell outside the range for

values of kurtosis. However, due to the sample size, the impact of skewness and kurtosis might not make a significant difference in further analyses (Tabachnick and Fidell, 2001). Skewness is a measure of a dataset's symmetry or lack of symmetry (Wheeler, 2016). This means a perfectly symmetrical dataset will have a skewness of 0 while the normal distribution has a skewness of 0. On the other hand, kurtosis is a measure of the combined sizes of the two tails. It measures the amount of probability in the tails in which the value is often compared to the kurtosis of the normal distribution, which is equal to 3. If the kurtosis is greater than 3, then the dataset has heavier tails than a normal distribution (more in the tails). If the kurtosis is less than 3, then the dataset has lighter tails than a normal distribution (less in the tails).

5.22.1 Exploratory Factor Analysis (EFA) – Customers

Bartlett's Test of Sphericity shows that the p-value = 0.000 <0.001, therefore making a factor analysis meaningful. In addition, since the global statistic Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.649 >0.50, it demonstrates that a factor analysis may be performed (Field, 2009). Bartlett's Test of Sphericity intends to determine if there is a high degree of correlation between the variables included. The null hypothesis here is H_0: the items are uncorrelated.

The finding reveals that the correlation between the variables and the factors is not exclusive, therefore, all of the variables are correlated to a greater or lesser degree with all the factors, although this may be much less applicable to one factor than another. After rotation of the component matrix, the results indicate that the constructs are classified in three components.

Moreover, some of the items load high on the expected two underlying dimensions while others do not. The law states that it requires to have a minimum loading of 0.50 on a certain factor or construct, but at the same time no more than 0.30 on another factor; then we may conclude that most of the items satisfy this requirement, except for: PIQ2, CD7, PPP5, PT2, PSP1, PRB2, PT3 and CD6. This may be an indication that these items should be kept out of the analysis. For the time being, these items will continue to be concluded in the CFA and the remaining items were retained including those that contributed for lower correlation value. Hence, for a visual representation that specifies the model's

constructs, indicator variables and interrelationships, confirmatory factor analysis (CFA) should be carried out. CFA provides quantitative measures of the reliability and validity of the constructs. With these results, this study will carry out the CFA on the holdout sample using only seven factors: PPP, PSP, PIQ, PRB, CD, PT and BT in the model.

5.23 Confirmatory Factor Analysis (CFA) – Customers

The confirmatory factor analysis (CFA) was used to test how well the measured variables represent the number of constructs in order to confirm or reject the measurement theory (Statistics Solutions, 2013). To achieve this analysis, Amos 18 was used. The paths among the fundamental exogenous and endogenous constructs were classified in the structural model, which is the second stage. Exogenous variables are the predictor variables, namely, PPP, PSP, PT, PIQ, PRB, BT and CD. The endogenous variables are the resulting variables that are a causal relationship – in this study, intention to use Internet banking.

To have the right decisions concerning reliable factors, there is a need to examine these items based on the following: unidimensionality, convergent validity, reliability and discriminant validity. Technically speaking, to run the model in Figure 4.1 in Chapter 5, there is a need to replace PPP, PSP, PT, PIQ, PRB, BT and CD by the symbols X1, X2, X3, X4, X5, X6 and X7**.**

5.23.1 Unidimensionality

In this feature, there is a need to examine that a set of variables has only one underlying dimension. The results in Table 4.12 (Appendix B,) show that all of the unstandardised loadings (regression weights) differ significantly from zero as indicated in the critical ratio (CR = t-value) that their values are all greater than 1.96. However, the loading for all variables measures have a high loading (>0.50) except for the variables: PPP4, PSP3, PT4, PT5, PRB17, PRB18, BT4, CD1 and CD16 and CD4 (their respective loading values are 0.432, 0.376, 0.473, 0.499, 0.283, 0.275, 0.431, 0.268, 0.433 and 0.442). So it is better to check the values measures in the standardised regression weight for these variables before being removed. Moreover, Table 4.13 in the Appendix shows that the standardised regression weight for PPP4, PSP3, PT4, PT5, PRP17, PRB18, BT4, CD1, CD16 and CD4 are more than 0.50 (0.867, 0.825, 0.821, 0.818, 0.813, 0.804, 0.929, 0.980, 0.970 and 0.986 respectively), and in reviewing the model, these variables will remain for the time being in the model. However, Table 4.14 in Appendix B indicates that the root mean square error of approximation (RMSEA) is 0.045, which is less than 0.08, indicates that the fit may be viewed as acceptable; furthermore, Table 4.15 in Appendix B shows that the Goodness of Fit Index (GFI) is equal to 0.940 >0.90 and the Adjusted Goodness of Fit Index (AGFI) is equal to 0.823 >0.80 which indicates a good fitness of the model. In addition, Table 4.16 shows that the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) are equal to 0.910 and 0.974 and both of these values are greater than 0.90. Hence the “overall fit” (general quality) of the measurement model is

good. Therefore, it is preferable to keep the variables PPP4, PSP3, PT4, PT5, PRP17, PRB18, BT4, CD1, CD16 and CD4. A model is regarded as acceptable if: the Goodness of Fit Index exceeds .90 (Byrne, 1994); the Comparative Fit Index exceeds .90 (Byrne, 1994); RMS is less than .08 (Browne and Cudeck, 1993) and ideally less than .05 (Stieger, 1990). Alternatively, the upper confidence interval of the RMS should not exceed .08 (Hu and Bentler, 1998). The relative chi-square should be less than 2 or 3 (Kline, 1998; Ullman, 2001).

5.23.2 Convergent Validity

Convergent validity is a feature that shows the degree to which two distinct indicators of a given latent variable confirm one another. One of the remarkable conditions in the output is that Table 4.12 shows that each of the loadings is significant (all of the CR >1.96); another strict condition is that the correlation between each indicator and the corresponding latent variable >0.50 as shown in Table 4.13. These two conditions are satisfied which indicate a convergent validity of the model.

5.23.3 Reliability

The reliability is determined on the basis of the “Composite Reliability” or “Construct Reliability” and the “Variance Extracted” that are calculated for each latent variable where the measurement error = 1 – (the reliability of the indicator), and the standardised loadings is the square multiple correlation as shown in Table 15.

These calculations show that the composite reliabilities of PPP, PSP, PT, BT, CD, PRB and PIQ are 0.982, 0.975, 0.971, 0.973, 0.996, 0.989 and 0.970 respectively where each of these values is greater than 0.70 thus satisfying the first condition for measuring reliability. Moreover, results in Table 4.19 (in Appendix B) show that the constructs PPP, PSP, PT, BT, CD, PRB and PIQ have values 0.859, 0.794, 0.850, 0.840, 0.925, 0.829 and 0.843 respectively, and each one of these values is greater than 0.50, thus satisfying the second condition for measuring reliability which connotes that all of the individual indicators have been measured consistently.

5.23.4 Discriminant Validity

To know if the correlation between constructs differs significantly from one another, the chi-square difference test was used, to find out if two constructs are not perfectly correlated. Table 4.20 in Appendix B represents the correlation between constructs which indicates a strong positive correlation between the constructs. Moreover, as shown in Table 4.21, none of the variances that are

shared by two constructs (squared correlation) are higher than the AVE of these constructs. Hence, it indicates discriminant validity for the seven constructs that were formed. Discriminant validity assumes that items should correlate higher among them than they correlate with other items from other constructs that are theoretically supposed not to correlate. This means that correlations between theoretically similar measures should be “high” while correlations between theoretically dissimilar measures should be “low”. In this study, measures of constructs that theoretically should be related to each other are, in fact, observed to be related to each other. Thus, the measurement model proves to be unidimensional, reliable and indicates convergent and discriminant validity. This means that all remaining factors show that there is a relation between the remaining seven factors and the intention to use Internet banking services in Bahrain. So, the following hypotheses are satisfied: H1, H2, H3, H4, H5, H6 and H7 are satisfied.

H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain.

H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain.

H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain.

H4 – Increased information quality reduces the barrier of perceived ease of use which positively affects the intention to use Internet banking services in Bahrain.

H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain.

H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain.

H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain.

Thus, the equation should be: Attitudes towards e-banking security = Increased privacy protection + Increased security protection + Increased trust of online banking services + Increased information quality + Reduced risks and increased benefits of online banking services + Adherence to certain dimensions of culture + Increased usage of biometrics.

5.24 Analysis

It could be inferred from the previous discussions that the measurement model proved to be unidimensional, reliable and indicates convergent and discriminant validity. This means that there is a relation between the seven factors and the intention to use Internet banking services in Bahrain. So, the following hypotheses are satisfied: H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain; H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain; H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain; H4 – Increased information

quality reduces the barrier of perceived ease of use which positively affects the intention to use Internet banking services in Bahrain; H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain; H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain; and H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain.

The first hypothesis, H1 – Increased privacy protection positively affects the intention to use Internet banking services in Bahrain is supported.

This finding was supported by the studies by Chiu et al. (2009) and Lee et al. (2011) who emphasised that new technology's complexity has made privacy an increasingly important issue; Featherman et al. (2010) pointed out consumers' perceptions of the potential loss of personally identifying information, including the potential for misuse of that information through, for example, identity theft; Mekovec and Hutinski (2012) reasoned that individual users are hesitant to use the services offered via the Internet: suspicions regarding the level of offered protection of their privacy and security of performing online transactions; Eurostat (2010) revealed that concerns regarding security of transactions and issues related to privacy concerns, e.g. loss of personal data; Cristobal, Flavia´n and Guinalı´u (2007) emphasised that banking customers expect that banks must not provide personal and account information about their customers to others.

The second hypothesis, H2 – Increased security protection positively affects the intention to use Internet banking services in Bahrain is supported.

This finding was supported by Hong et al. (2003) who underscored that the main goal of information security is to ensure the confidentiality of data within the system, establishing and upholding the integrity of data as well as the availability of information processing resources; Gorman (2007:563) pointed out "*Internet security is a global issue requiring coordinated, global actions to improve security at all levels*". Chang and Ho (2006) explained that data security is a major issue for businesses and most banks recognise that information; Gorman (2007) pointed out that the proliferation of scams, phishing and other methods of breaching Internet security have underscored the vulnerability of investments which explains the widespread interest in the subject of online security.

The third hypothesis, H3 – Increased trust of online banking services positively affects the intention to use Internet banking services in Bahrain is supported.

This finding is supported by Chong et al. (2010) who said trust is the extent to which the customer believes that Internet banking is safe and has no privacy threats; lack of trust is one of the most frequently cited reasons why consumers avoid e-commerce transactions (Lee and Turban, 2001); consumers who do not trust the seller will refuse to involve themselves in online transactions (Gefen et

al., 2002; Kim et al., 2008); online trust is a very important factor in determining the success of an online website (McKnight and Chervany, 2001; Balasubramanian et al., 2003; Grabner-Krauter and Kaluscha, 2003; Koufaris and Hampton-Sosa, 2004); low level of trust tends to inhibit the adoption of Internet banking because of “no face-to-face interaction when making an online transaction”; the transmission of private data and financial details demands a high level of consumer confidence (Cristobal et al., 2007:319; Miyazaki and Fernandez, 2001; Gefen et al., 2003; Nissenbaum, 2004; Lichtenstein and Williamson, 2006:52); low level of trust among banks was the result of the financial crisis which led to the erosion of public confidence in economic institutions and policies (Julian, 2009).

The fourth hypothesis, H4 – Increased information quality reduces the barrier of perceived ease of use which positively affects the intention to use Internet banking services in Bahrain is supported.

Bailey and Pearson (1983) point out that operational potential of information quality depends on factors like accuracy, precision, currency, timeliness, reliability, completeness, conciseness, relevance and the preferred format. Other authors include other measures like sufficiency, understandability, freedom from bias, timeliness, reliability, relevance to decisions, comparability and quantitativeness (King and Epstein, 1983); completeness of information and accuracy of information (Miller and Doyle, 1987); ease of navigation, privacy and

security (Molla and Licker, 2001; Palmer, 2002); and customisation which are some of the system quality measures discussed by Delone and McLean (2003); accuracy, content, format and timeliness (Cheung, 2002); currency, completeness and consistency were considered by Livari (2005) and concepts of personalisation and relevance security (DeLone and McLean, 2003).

The fifth hypothesis, H5 – Reduced risks and increased benefits of online banking services positively affect the intention to use Internet banking services in Bahrain is supported.

This finding was supported by Ndlovu and Sigola (2005) who revealed that major benefits of e-banking are improved convenience to customers, cost reduction and an improvement in customer loyalty. However, the perceived risks of e-banking were low levels of computer literacy, low security levels, lack of access to the Internet for the majority of the population and operational problems associated with computer systems for most banks. Rogers (2010) observed that four attitudinal factors have strong influences on Internet banking adoption, namely value to banking needs, compatibility, complexity and trialability. Value of the Internet to banking needs significantly predicts Internet banking adoption which means individuals who deem Internet banking useful in fulfilling their banking needs, such as the need to have better control of their own financial accounts, and those seeking the most convenient channel to have close monitoring of these accounts, have more promising prospects; Montazemi and

Saremi (2013) underscored that Internet banking is expected to appeal to consumers with benefits such as cost savings, greater control over service delivery, reduced waiting times, higher perceived levels of customisation and convenient access to services without time or space constraints. This application of information technology also appeals to financial institutions because it can standardise service delivery, reduce labour and service costs, expand the options for delivery and reach customers who are unreachable through other channels.

The sixth hypothesis, H6 – Adherence to certain dimensions of culture positively affects the intention to use Internet banking services in Bahrain is supported.

This finding was supported by various authors like Baker et al. (2010) who contributed to understanding the effects of cultural contexts in influencing technology acceptance behaviours. Lee et al. (2013) found that in individualistic cultures, people tend to look for information on their own from direct and conventional sources, whereas in collectivistic cultures, people rely more on subjective evaluation of an innovation. Gupta et al. (2012) found that organisational culture influences the adoption of Internet technology (UTAUT). Sana et al. (2010) found that masculinity has no effect on the diffusion, whereas uncertainty avoidance has the greatest effect. Zakour (2004) integrated six cultural values-dimensions in his research model pertaining to comparative and cross-cultural management and showing a high variability between countries,

which are “individualism/collectivism”, “power distance”, “masculinity/femininity”, “uncertainty avoidance” (Hofstede, 1997), “monochromic/polychromic time” (Trompenaars, Hampden-Turner, 1998; Hall, 1989) and “high context/low context” (Hall, 1989). Durfee et al. (2006) found that the cultural dimensions affected instant message usage within Mexico and the United States; Srite and Karahanna (2006) found that social influence had a stronger influence on intention to adopt IT than PU in high power distance, uncertainty avoidance and masculine cultures. Akour et al. (2006) found that power distance and collectivism impacted significantly and positively, whilst uncertainty avoidance and femininity had no impact at all. Zakour (2007) found that high power distance cultures are less accepting of IT than those from low power distance cultures. Masculine cultures are more established for IT usage, because the use of IT is associated with accomplishing their goals. Li et al. (2009) found that individualism and time orientation influences perceived ease of use (PEOU) and perceived usefulness (PU), directly. Four of Hofstede’s dimensions had no significant moderating effect on the relationship between social influence and intention.

The last hypothesis, H7 – Increased usage of biometrics positively affects the intention to use Internet banking services in Bahrain is supported.

This finding was supported by Hussain (2015) who pointed out that biometric identification methods are automated and provide fast and accurate customer authentication; provides optimal identification accuracy and security. Biometrics

in banking can eliminate the loopholes of a banking system that criminals can exploit and has the versatility to secure all financial transactions such as branch banking, Internet banking, mobile banking and ATM networks. Adopting biometrics for customer identification in a banking system secures transactions and brings numerous benefits and a positive impact in this industry.

Accenture.com (2014) revealed that by using biometrics, it is possible to confirm an individual's identity based on "who they are", rather than by documentation – "what they have", or passwords – "what they know". The combination of these factors makes it possible to gain higher levels of security.

In the same manner, Fatima (2011) pointed out that biometrics is actually an effective strategy for protection of privacy and detection of fraud; while biometric sensors continue to become less expensive and smaller in size, the negative perception of biometrics as encroachment on individual privacy continues to decline. Other researchers support the current finding such as Alhussain and Drew (2009), Ashbourn (2004) and Uzoka and Ndzinge (2009), who said that the security issues can be enhanced by using biometric technologies: biometric payment systems in which nobody has to take with them dozens of cards for shopping, travelling, a pass to enter the office, university or bank as a door lock, Internet online shopping and many situations where a card system is installed (Kumar and Ryu, 2009). Likewise, Brobeck and Folkman (2005) show that companies believe that biometrics is for organisations with a very high security

need. Furthermore the result shows that individuals are positive towards biometrics. Fingerscan is the most known, trusted and preferred technology. Fahad et al. (2008) stated that the majority of Saudis would have a preference to use fingerprint identification methods and using the biometric authentication system in the online banking environment can be predicted by using the Technology Acceptance Model.

5.25 Path Analysis

A path analysis was conducted in order to find out the effect of CD and BT on the intention to use Internet banking services in Bahrain as explained by PPP, PSP, PT, PIQ and PRB. To do this, the co-variance arrows from Figure 4.1 should be removed and the model in Figure 5.2 was tested.

The sub-hypotheses for cultural dimension (CD) are stated as follows:

H6a Cultural dimension has significant positive influence on perceived privacy protection (PPP) – Supported

H6b Cultural dimension has significant positive influence on perceived security protection (PSP) – Supported

H6c Cultural dimension has significant positive influence on perceived trust (PT) – Supported

H6d Cultural dimension has significant positive influence on perceived information quality (PIQ) – Supported

H6e Cultural dimension has significant positive influence on perceived risks and benefits (PRB) – Supported

The results of unstandardised and standardised regression coefficients tests in Table 4.26 and Table 4.27 show that BT appears to have a significant influence on all of perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ) and perceived risks and benefits (PRB). The effect of biometric technology (BT) on perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ) and perceived risks and benefits (PRB) is positive (correlation = 0.289, 0.977, 0.944 and 0.544 respectively).

However, biometric technology (BT) appears to have no significant influence on perceived privacy protection (PPP) (CR or t-value is -1.836, which is less than 1.96 in absolute value, and has a significance greater than 0.001 since p-value = 0.066). Moreover, the effect of BT on PPP is very weak and negative (correlation = -0.030) which explains that this variable has no significant influence on PPP theoretically.

The sub-hypotheses for biometric technology (BT) are as follows:

H7a BT has significant positive influence on perceived privacy protection (PPP) – Not supported

H7b BT has significant positive influence on perceived security protection (PSP)

– Supported

H7c BT has significant positive influence on perceived trust (PT) – Supported

H7d BT has significant positive influence on perceived information quality (PIQ) – Supported

H7e BT has significant positive influence on perceived risks and benefits (PRB) – Supported

The fit solution in Tables 4.22, 4.23, 4.24, 4.25, 4.26 and 4.27 shows that the chi-square value is 3201.945 with a p-value of 0.075 >0.05, and the null hypothesis that the co-variance matrix generated by the model is equal to the observed covariance matrix cannot be rejected. Since GFI = 0.985 >0.90, AFGI = 0.834 >0.80, TLI = 0.982 >0.90 and RMSEA = 0.043 <0.05, then the model is a qualitatively good one.

In addition, in Table 4.26 and Table 4.27, CD appears to have a significant influence on all of PPP, PSP, PT, PIQ and PRB. Moreover, the effect of CD on perceived privacy protection (PPP), perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ), perceived risks and benefits (PRB) is positive (correlation = 0.995, 0.956, 0.199, 0.375 and 0.843 respectively). This result is also logical since a positive correlation shows that as one variable increases in value, the second variable also increases in value or if X value increases, the Y value increases. Finally, Figure 5.4 represents the path diagram which also supports the previous discussion.

However, biometric technology (BT) appears to have no significant influence on perceived privacy protection (PPP) (CR or t-value is -1.836, which is less than 1.96 in absolute value, and has a significance greater than 0.001 since p-value = 0.066). Moreover, the effect of BT on PPP is very weak which shows a weak negative correlation.

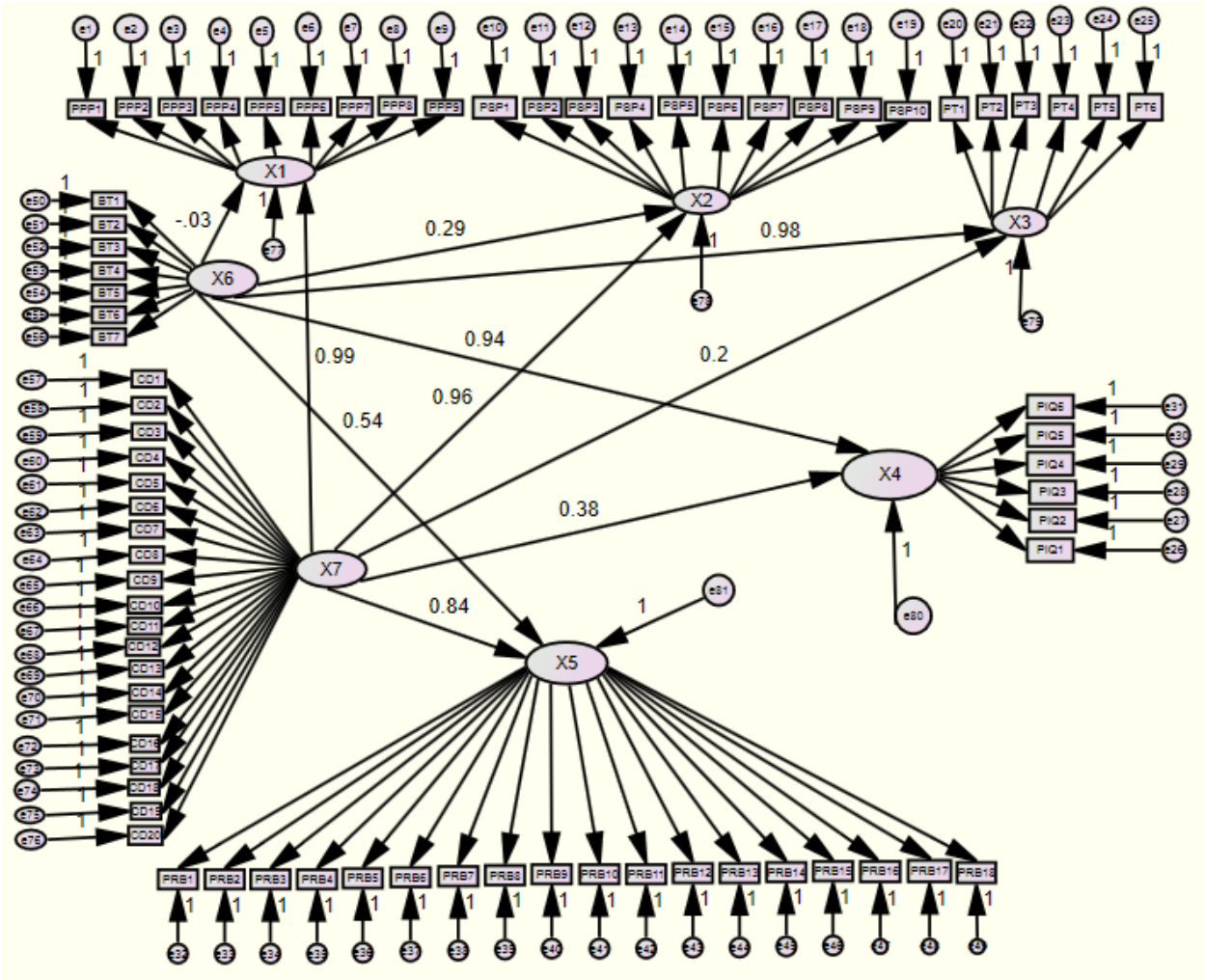

Figure 5.4 Path Analysis Diagram

Overall, the path analysis showed that the unstandardised and standardised regression coefficients (BT) appear to have a significant influence on all of PPP, PSP, PT, PIQ and PRB. Likewise, CD appears to have a significant influence on all of PPP, PSP, PT, PIQ and PRB. Thus, the equation should be: Attitudes towards e-banking services = Increased privacy protection + Increased security protection + Increased trust of online banking services + Increased information quality + Reduced risks and increased benefits of online banking services + Adherence to certain dimensions of culture + Increased usage of biometrics. Thus, the proposed post model is acceptable.

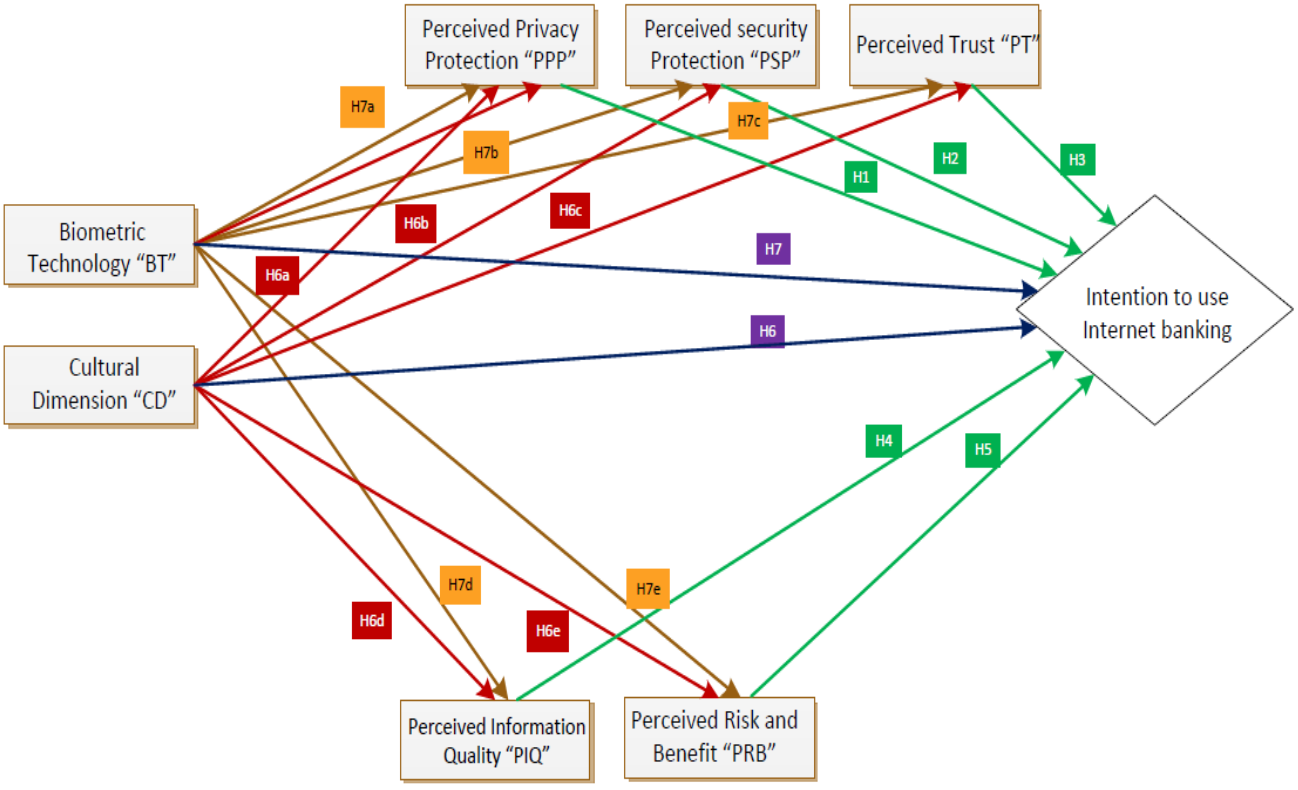

Figure 5.5 Post Conceptual Model (Developed by the Researcher)

5.26 Implications of Research Findings

5.26.1 Theoretical Implications

The study proposed a new conceptual model that clearly describes the issues associated with Internet banking in the Kingdom of Bahrain. The technology acceptance model (TAM) developed by Davis (1989) serves as the basis of developing a conceptual model which could also be relevant to how consumers accept or reject Internet banking services. Initially, five variables were chosen: perceived privacy protection, perceived security protection, perceived trust, perceived information quality and perceived risks/benefits, as factors that may affect intention to use Internet banking. In addition, two more variables were included: cultural dimension and biometric technology to measure a significant relationship with any of the five variables already mentioned.

In this study, the proposed measurement model proves to be unidimensional, reliable and valid thus proving that there is a relation between the seven factors and the intention to use Internet banking services in Bahrain. Interestingly, the results revealed that cultural dimension (CD) has significant and positive influence on perceived privacy protection (PPP), perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ) perceived risks and benefits (PRB). Furthermore, BT shows a significant influence on perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ) and perceived risks and benefits (PRB). However, biometric technology

(BT) appears to have no significant influence on perceived privacy protection (PPP). Thus, the model revealed that the inclusion of both cultural dimension and biometric technology as external variables is considered theoretically appealing and empirically significant.

Interestingly, since the present study offers a renewed insight into studying the uptake of the Internet in Bahrain's context by adopting Hofstede's cultural dimensions, a deeper understanding of cultural context may open up new avenues on how Internet banking is accepted or rejected by bank customers in other parts of the world.

5.26.2 Managerial Implications

Since it was found that the majority of the bank customers were “young adults”, predominantly males and college degree holders, a thorough investigation is needed on what aspects of products and online banking services may be offered in order to capture and retain this market segment. Marketing managers must conduct an in-depth investigation on strategies to be employed so as to maintain a long-lasting business relationship with this identified market segment.

Moreover, the results of the study highlight that privacy as perceived by the customers has underlying risks like the potential loss of personally identifying information, including the potential for misuse of that information, so it is therefore necessary to satiate the privacy needs of the bank customers. Bank IT managers, software designers and developers must look into additional privacy measures that will maintain and secure the personal information of Internet users in order to increase their confidence with the banks. Likewise, a tight security policy must be developed and implemented by online banks to decrease both internal and external threats and minimise organisational risk due to security breaches. For instance, developers may create and produce a prototype framework of a third security factor, which is a biometric fingerprint, which could be used as a third layer of authentication.

Likewise, since it was found that a low level of trust tends to inhibit the adoption

of Internet banking, bank administrators and managers must go the extra mile in developing the trusting relationship with their customers because there is no face-to-face interaction when conducting an online transaction. The transmission of private data and financial details could lead to abuse which demands a high level of consumer trust. Consequently, the banks under study must develop and use a portfolio of strategies to build the customers' trust. As noted in the literature and empirical studies, communicating trustworthiness is an important factor in the trust development between the bank and its customers.

In addition, since it was found that the slow diffusion of Internet banking could be attributed to its technical nature and self-service features and was perceived to hinder social relationships, it is necessary that the banks under study must carry out initiatives to be aware of the problems encountered by their customers. This could be done by creating feedback counters or suggestion boxes in order to improve their services and to create a positive image of the bank. In addition, the bank management must create and adopt communication strategies by sending timely and meaningful information to their customers so as to enhance trustworthiness perceptions of Internet banking services.

Moreover, the government of the Kingdom of Bahrain must tighten its policies and procedures on Internet banking. The literature survey on Internet banking globally suggests that the role of government in establishing a proactive policy based on role modelling of the application of e-business practices is very important factor in

the adoption of this type of innovation. Although Bahrain's legislative foundation protects the public from Internet crime, the lack of information and awareness among customers leads to a relatively slow diffusion of Internet banking.

5.27 Contributions of the Research

Based on the findings, the following contributions are enumerated:

First, this study has examined the issues related to the adoption of Internet banking and discussed theories which served as bases on the model development and, implicitly, on the hypotheses to be tested in order to validate a model for the acceptance of Internet banking services. Among the various user acceptance theories are the Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM) which are considered to be the most widely accepted and used by IT researchers. The reviewed literature on the models cleared the path towards understanding in-depth the research objectives, identified the major studies related to the area of research and encapsulated the relevance of the research problem. Thus, by identifying the gaps of the previous studies, the current investigation has generated a model as a basis for identifying the factors related to the intention to use Internet banking and its adoption.

Second, output of the investigation may contribute to the growing literature in

both a global and local context on the issues of customer retention especially in the field of Internet banking. This move could also help managers, marketers and software engineers to better understand which factors encourage consumers to use Internet banking.

Third, this study has investigated the perceived technological barriers and the cultural factors that affect the adoption of Internet banking. Based on the findings from both the empirical and secondary sources, the present study offers a fresh insight on studying the uptake of Internet adoption in the Bahrain context by adopting Hofstede's cultural dimensions.

Fourth, the results of the study have supported Hofstede's four cultural dimensions, namely: power distance, uncertainty avoidance, low individualism (IDV) and masculinity. Although Bahrain is a masculine society as a result of its Arab culture, adoption of technology, specifically, Internet banking, reveals its feminine side (quality of life and care for others).

Fifth, the current study proposed a new conceptual model that clearly describes the known issues associated with Internet banking. The results of the study revealed that the seven factors, namely, perceived privacy protection, perceived security protection, perceived trust of banking services, perceived information quality, perceived risk and benefits, appropriate biometric technology and the perceptions on cultural dimensions affect the Internet adoption of banking

services in the Kingdom of Bahrain.

5.28 Limitations of the Study

The following limitations are identified in this investigation. These limitations are the constraints on the generalisability and utility of findings that are the results of the design used in this study to establish the internal and external validity**.**

In this study, the Likert-type or frequency scales were used to measure the attitudes or opinions of the respondents towards Internet banking adoption. This type of scale assumes that the strength/intensity of experience is linear from “strongly agree” to “strongly disagree”. The respondents were offered a choice of five pre-coded responses with the neutral point being “neither agree nor disagree”. While the Likert ccale is considered the most universal method for survey collection, easily understood, quick, efficient and inexpensive, it is uni-dimensional and only gives five options of choice, and the space between each choice cannot possibly be equidistant. Moreover, respondents may avoid choosing the “extreme” options on the scale, because of the negative implications involved with “extremists”, even if an extreme choice would be the most accurate.

Another limitation that challenged the researcher was the lack of available and/or

reliable data that limited the scope of analysis that could have sufficiently added a meaningful relationship between variables. As mentioned earlier, the scarcity of study as regards Internet banking adoption based on Hofstede's cultural dimensions was evident. In the same manner, there was a lack of prior studies that delve into biometric technologies in the Kingdom of Bahrain or elsewhere in the Gulf countries. Likewise, this study was limited by longitudinal effect which was constrained by the time frame for submission of the research.

5.29 Recommendations for Further Studies

Based on the current findings, the following avenues for research are recommended:

Future researchers are encouraged to search for other variables that may affect the slow diffusion of Internet banking in the Kingdom of Bahrain. A wider scope of investigation must be used to dig deeper into political, economic, social, technological and legal problems encountered by bank customers/depositors in the field of Internet banking adoption.

Moreover, innovative researchers are also encouraged to use multiple theoretical and methodological lenses to study technology adoption and diffusion not only in the Kingdom of Bahrain but also in the Gulf countries so as to increase the level of awareness among Internet banking adopters. Interestingly, since the present

study offers a renewed insight into studying the uptake of Internet adoption in Bahrain's context by adopting Hofstede's cultural dimensions, a deeper understanding of cultural context must be pursued.

Lastly, since the current research adopted a new conceptual framework in proving the hypotheses of the study, it would be interesting to know if other researchers could hypothesise a new framework to further produce new insights in the adoption of Internet banking and technology diffusion specifically in the Kingdom of Bahrain.

Concluding Remarks

This chapter discussed the findings based on the research questions through the factors which affect the adoption of Internet banking. The first part discussed the overview of the aim and objectives of the study in order to examine the factors which may affect the adoption of Internet banking in the Kingdom of Bahrain. The Technology Acceptance Model (TAM) serves as the basis of developing a conceptual model which was chosen because of its flexibility to be extended and applied to many different information systems. Five variables were initially chosen, namely, perceived privacy protection, perceived security protection, perceived trust, perceived information quality and perceived risks/benefits and two more variables were added, the cultural dimension and biometric technology, to measure a significant relationship with any of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain.

A response rate of 90.9% was recorded wherein 300 questionnaires were used out of 330 distributed to the customers of selected local, regional and international banks operating in the Kingdom of Bahrain. The descriptive statistics used were frequency, percent, median, standard deviation, skewness, kurtosis and Pearson correlation to analyse the data. Other statistical tools used were the convergent validity, construct reliability and discriminant validity tests. Furthermore, the structural equation modelling (SEM) was used to test the research model and verify the hypotheses. In order to conduct the analysis, the researcher used the Software Package for Social Sciences (SPSS Amos version 18) which is a commonly used software package for data analysis (Mghoi and Gichuho, 2013).

In this study, structural equation modelling (SEM) helped in identifying a set of independent constructs or variables that explain a particular dependent construct or variable. Moreover, two sets of factor analyses were applied: the confirmatory factor analysis (CFA) to identify the causal relationships among observed factors and the fundamental theoretical constructs, and the exploratory factor analysis (EFA) which aimed to reveal the nature of the factors influencing a set of responses.

6.0 CHAPTER 6

6.1 Summary and Conclusions

The main aim of this study was to examine the factors which may affect the adoption of Internet banking in the Kingdom of Bahrain with the following research objectives to be achieved: (1) To identify the factors which affect the adoption of Internet banking in the Kingdom of Bahrain; (2) To develop a model based on the identified factors that affect the intention to use Internet banking in the Kingdom of Bahrain; and (3) To test the reliability and validity of the proposed model and find its implications on the intention to use and adopt Internet banking.

The Technology Acceptance Model (TAM) developed by Davis (1989) serves as the basis of developing a conceptual model which could also be relevant to how consumers accept or reject Internet banking services. This model has been chosen since it has tremendous flexibility to be extended and applied to many different information systems. In this study, five variables were initially chosen, namely, perceived privacy protection, perceived security protection, perceived trust, perceived information quality and perceived risks/benefits. Beside the five variables, two more variables were included: cultural dimension and biometric technology to measure a significant relationship with any of the five variables that might affect the intention of bank customers to use Internet banking in Bahrain.

In this study, the application of descriptive research was used to describe the demographic profiles of the respondents with the use of descriptive statistics like frequencies, percentages, mean and standard deviation. The exploratory research was also employed during the first stage of the research in order to obtain the background information about the research problem and to generate hypotheses by having a thorough investigation of the literature. As a quantitative method of research, the study focused on assessing the co-variation among naturally occurring variables with the goal of identifying predictive relationships by using correlations.

In analysing the data, the descriptive statistics used were frequency, percent, median, standard deviation, skewness, kurtosis and Pearson correlation. Further to testing the convergent validity and computing the descriptive statistics, construct reliability and discriminant validity tests were conducted and structural equation modelling was used to test the research model and verify the hypotheses.

This study has produced seven specific research questions with their corresponding answers:

1. How may the demographic profile and Internet background of the respondents be described?

The results of the survey revealed that 30% of the respondents were dominated by the 24-34 year-old age group, 62% of the 24% have a Master's degree. In general, bank customers are heavy users of the respondents were all male. The majority (or 62%) were employees. The output of the study also revealed that in terms of education, 46% were bachelor's degree holders since most of them are using it several times a day, 49% of the respondents said they want to "Keep in touch with friends and relatives" (social media/Facebook) while a minority (12%) said they used it for banking services.

2. From the perspectives of the respondents, what are the influencing factors that may lead to the intention and use of Internet banking?

With respect to privacy concerns on online services based on the five-point Likert scaling method, the respondents showed negative responses to the statements: "Keeping in touch with friends and relatives", "work" and "banking".

The respondents have shown positive perceptions of the security of smart phones, computers, laptops and tablets/PDAs. However, they believed that mobile phones were not very secure.

It was noted from the perspectives of the respondents that they were concerned that "too much personal information is being collected when they use online banking", verbally interpreted as "strongly agree". The findings revealed that

respondents were concerned about how their personal information is collected when using online banking activities. In terms of perceived security protection, the results revealed that the lowest mean was for item: “Security features are important to them when choosing Internet banking”, 1.29, “strongly agree”.

In terms of perceived trust, it was interesting to note that the highest mean on this dimension was reflected with the statement: “Overall, I trust my bank to provide me with secure online banking services”, 4.09 interpreted as “disagree”. Moreover, five other statements were given “undecided” ratings by the respondents.

In terms of perceived information quality, four out of six items were agreed upon by the respondents in which the lowest mean was found for the item: “The information provided by my bank for online banking is useful”, 2.17. Interestingly, two statements were given “undecided” remarks by the respondents.

3. From the perspectives of the respondents, what are the possible risks and benefits towards the intention and use of Internet banking?

In terms of the perceived risks and benefits of the adoption of Internet banking, almost all items were agreed upon by the respondents. The lowest mean was found for the statement: “The risk of not being able to get a good quality service using online banking is higher than conventional face-to-face banking” and

seconded by “The risk of fraud using Internet banking is higher than conventional face-to-face banking”.

4. What biometric technology may be considered so as to increase the intention to use Internet banking among bank customers?

In terms of biometric technology to be considered for authenticating the customer, the findings showed that it would have been better to have a fingerprint recognition reader – automated biometric scanner to authenticate the fingerprint of the individual. However, the respondents disagreed on two items, digital signature and hand recognition.

5. What cultural dimensions may directly affect the intention to use Internet banking?

In terms of cultural dimensions, the current findings support the Arab world findings which reflect PDI, IDV, MAS and UAI. Hofstede has identified large PDI (80) and UAI (68) for the Arab world where the society is highly rule-oriented, risk averse and does not readily accept change. Hierarchy in an organisation is seen as reflecting inherent inequalities. The Arab world has a high preference for avoiding uncertainty. Moreover, innovation may be resisted, and security is an important element in individual motivation. Furthermore, according to Hofstede, the high MAS index (52) may be more a result of the Muslim religion than culture.

Finally, the relatively low IDV (38) indicates a society where loyalty and close long-term commitment to groups such as family is paramount. This is manifested in a close long-term commitment to the member “group”, be that a family, extended family or extended relationships. Loyalty in a collectivist culture is paramount, and overrides most other societal rules and regulations. Thus, it could be inferred that cultural dimensions have significant relationships with Internet banking adoption.

6. What conceptual model may be developed which explains the key variables that may affect customers in their intention to use and adopt Internet banking?

In this study, the proposed measurement model proved to be unidimensional, reliable and valid thus proving that there is a relation between the seven factors and the intention to use Internet banking services in Bahrain. Interestingly, the results revealed that cultural dimension (CD) has significant and positive influence on perceived privacy protection (PPP), perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ), perceived risks and benefits (PRB). Furthermore, BT shows a significant influence on all of perceived security protection (PSP), perceived trust (PT), perceived information quality (PIQ), and perceived risks and benefits (PRB). However, biometric technology (BT) appears to have no significant influence on perceived privacy protection (PPP). Thus, the model revealed that inclusion of both cultural

dimension and biometric technology as external variables proved its significance in the intention to use online banking in the Kingdom of Bahrain which is considered theoretically appealing and empirically significant.

7. What are the theoretical and managerial implications that may be derived from the findings of the study?

Since the present study offers a fresh insight into studying the uptake of the Internet in Bahrain's context by adopting Hofstede's cultural dimensions, a deeper understanding of cultural context may open up new avenues on how Internet banking is accepted or rejected by bank customers in other parts of the world.

Since it was found that the majority of the bank customers were "young adults", predominantly males and college degree holders, a thorough investigation is needed on what aspects of products and online banking services may be offered in order to capture and retain this market segment. Marketing managers must conduct an in-depth investigation to maintain a long-lasting business relationship with this identified market segment.

Moreover, the results of the study point out that privacy as perceived by the customers has underlying risks like the potential loss of personally identifying

information, including the potential for misuse of that information, so it is therefore necessary to satiate the privacy needs of the bank customers. Bank IT managers, software designers and developers must look into additional privacy measures that will maintain and secure the personal information of Internet users in order to increase their confidence with the banks. Likewise, a tight security policy must be developed and implemented by online banks to decrease both internal and external threats and minimise organisational risk to incidents due to security breaches. For instance, developers may create and produce a prototype framework of a third security factor, which is a biometric fingerprint, which could be used as a third layer of authentication.

Likewise, since it was found that a low level of trust tends to inhibit the adoption of Internet banking, bank administrators and managers must go the extra mile in developing the trusting relationship with their customers because there is no face-to-face interaction when conducting an online transaction. The transmission of private data and financial details could lead to abuse which demands a high level of consumer trust. Consequently, the banks under study must develop and use a portfolio of strategies to build the customers' trust. As noted in the literature and empirical studies, communicating trustworthiness is an important factor in the trust development.

In addition, since it was found that the slow diffusion of Internet banking could be attributed to its technical nature and self-service features and was perceived to

hinder social relationships, it is necessary that the banks under study must carry out initiatives to be aware of the problems encountered by their customers/depositors. This could be done by creating feedback counters or suggestion boxes in order to improve their services and to create a positive image of the bank. In addition, the bank management must create and adopt communication strategies by sending timely and meaningful information to their customers so as to enhance trustworthiness perceptions of Internet banking services.

Moreover, the government of the Kingdom of Bahrain must tighten its policies and procedures on Internet banking. The literature survey relative to the uptake of Internet banking globally suggests that the role of government in establishing a proactive policy based on role modelling of the application of e-business practices is a very important factor in the adoption of this type of innovation. Although Bahrain's legislative foundation protects the public from Internet crime, due to the lack of information and awareness among customers, there is a slow diffusion of Internet banking.

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8.0 Appendixes

Appendix A

SURVEY QUESTIONNAIRE

Direction: We are trying to understand the issues related to customer concerns about online banking in Bahrain, This study is purely for research purposes only and any answers you provide will be anonymous and confidential and no individual will be identified. Your response is very valuable to this research and we thank you in advance for your contribution.

Part I: The Demographic Profile of the respondents (customers)

Please tick (/) the appropriate circle which corresponds to your answer.

Demographic profile:

a) Age

○ 16-18

○ 19-23

○ 24-34

○ 35-50

○ 51-65

○Over 65

b) Gender

○ Male ○Female

c) Employment: what sector do you work in

○Education

○ Manufacturing

○Banking services

○ Financial,

○ Others, please specify_____

d) Role/title: what is your role?

○ Sales manager,

○ Salesperson,

○ Primary school teacher

○ Employee

○ Others, please specify_____

e) Education:

○Left school at 16

○High school diploma

○Bachelor's degree

○Master's degree

○PhD

○ Others, please specify _____

Background regarding use of Internet

How often do you use the Internet?

○ (Very often) Several times a day;

○Often once a day;

○Quite often (several times a week but not every day);

○Not very often (several times a month)

○Not often (several times a year)

○Not at all

f) Reasons why you use the Internet for?

I use the Internet mainly for

○Searching for information

○Entertainment (movies and games)

○Keeping in touch with friends and relatives (social media/Facebook)

○News

○For work

○Shopping

○Banking

○For government services

○For education

○Other please state

Please state the extent to which you agree with the following statements:

a-I have no concerns about my privacy when using the following services on line

(1- strongly agree 5= strongly disagree)

Searching for information	1 2 3 4 5
Entertainment (movies and games)	1 2 3 4 5
Keeping in touch with friends and relatives	1 2 3 4 5

News	1 2 3 4 5
For work	1 2 3 4 5
Shopping	1 2 3 4 5
Banking	1 2 3 4 5
For government services	1 2 3 4 5
For education	1 2 3 4 5

Others, please specify

_____

_____

b-I have no concerns about security when using the following services on line

(1- strongly agree 5= strongly disagree)

Searching for information	1 2 3 4 5
Entertainment (movies and games)	1 2 3 4 5
Keeping in touch with friends and relatives	1 2 3 4 5
News	1 2 3 4 5
For work	1 2 3 4 5
Shopping	1 2 3 4 5
Banking	1 2 3 4 5
For government services	1 2 3 4 5
For education	1 2 3 4 5

Others, please specify_____

Which devices do you use to access the Internet: 1= Always 2= Very often 3= Often 4= Not very often 5= Never

Mobile phone	1 2 3 4 5
Smart phone	1 2 3 4 5
Computer	1 2 3 4 5
Laptop	1 2 3 45
Tablet/PDA	1 2 3 45

How secure do you consider the following devices to be? 1=very secure 2= secure 3= quite secure 4= not very secure 5= not at all secure

Mobile phone	1 2 3 4 5
Smart phone	1 2 3 4 5
Computer	1 2 3 4 5
Laptop	1 2 3 4 5
Tablet/PDA	1 2 3 4 5

Which devices do you use the Internet to access the following services:

1= Always 2= Very often 3= Often 4= Not very often 5= Never

Service type	Computer/laptop	Mobile	Tablet/iPad

		phone	
Searching for information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Watching movies/playing games	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Social media (Facebook/twitter)	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
News	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Shopping	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Banking	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Education services	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Work services	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Government services	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Part II: The Factors Influencing the Adoption of Internet Banking in Bahrain

Direction: Please rate the following terms based on the factors influencing the adoption of Internet banking in Bahrain by ticking the appropriate circle. On the scale of 1 – 5, please rate the following using the scale below:

Scale	Verbal Interpretation
1	Strongly Agree
2	Agree
3	Undecided
4	Disagree
5	Strongly Disagree

(Belanger et al. 2002/Kim et al. 2008; Measures for Trust and security from Kim et al. Decision support systems (2008) vol 44 pages 544-564

Here we will examine the relationship between trust, risk and perceived benefit

The Factors Influencing the Adoption of Internet Banking		Rating Scale				
a. Privacy Perceived Privacy Protection (PPP) (Kim et al, 2008)		1	2	3	4	5
1	My bank keeps all my personal information confidential	○	○	○	○	○
2	The personal information held by my bank is used only for improving the accuracy of the services they provide me.	○	○	○	○	○
3	The personal information held by my bank is not shared with other organisations without my consent.	○	○	○	○	○
4	The personal information held by my bank is stored and used according to legal or regulatory requirements only.	○	○	○	○	○
5	Overall, I am confident that my personal information held by my bank is kept private	○	○	○	○	○
6	When I use online banking I am concerned about the privacy of my personal information	○	○	○	○	○

7	Unauthorised persons (i.e. hackers) have access to my personal information when I use online banking	○	○	○	○	○
8	I am concerned that too much personal information is being collected when I use online banking	○	○	○	○	○
9	The information collected when I use online banking will be kept private by my bank	○	○	○	○	○
b. Security – Perceived security protection		Rating Scale				
1	Security features are important to me when choosing Internet banking.	○	○	○	○	○
2	My bank implements security measures to protect me when I use online banking	○	○	○	○	○
3	My bank provides a secured service when I use Internet banking.	○	○	○	○	○
4	I feel secure when using Internet banking.	○	○	○	○	○
5	I use online banking because I believe it is secure	○	○	○	○	○
6	I think current password based authentication for online banking is very secure	○	○	○	○	○

7	I do not/would not use online banking because it is not secure	○	○	○	○	○
8	I use online banking even though I believe it is not secure	○	○	○	○	○
9	My bank usually ensures that transactional information is protected from accidentally being altered or destroyed during a transmission on the Internet	○	○	○	○	○
10	In general, online banking is riskier than telephone banking	○	○	○	○	○
c. Trust		Rating Scale				
1	Overall my bank provides an online service that is trustworthy	○	○	○	○	○
2	I trust my bank to keep its promises and commitments	○	○	○	○	○
3	I trust my bank to resolve any issues if something goes wrong with my online banking transactions.	○	○	○	○	○
4	Overall I trust my bank to provide me with secure	○	○	○	○	○

	online banking services					
5	I would never use online banking services because I don't trust my bank to provide a secure service	○	○	○	○	○
6	I would never use online banking services because the Internet is not secure	○	○	○	○	○
d	Information quality (belanger et al. 2002/Kim et al. 2008))	Rating Scale				
1	The information provided by my bank for online banking is complete.	○	○	○	○	○
2	My bank provides enough information to convince me that online banking is safe.	○	○	○	○	○
3	The information provided by my bank for online banking is useful.	○	○	○	○	○
4	The information provided by my bank for online banking is reliable.	○	○	○	○	○
5	The information provided by my bank when I make online transaction is clear.	○	○	○	○	○
6	Overall the information provided by my bank for online banking is of high quality.	○	○	○	○	○

Part III. Perceived Barriers on the Adoption of Internet Banking in Bahrain

Direction: Please rate the following terms based on the perceived barriers on the adoption of Internet banking in Bahrain by ticking the appropriate circle. On the scale of 1 – 5, please rate the following using the scale below:

Scale	Verbal Interpretation
1	Strongly Agree
2	Agree
3	Undecided
4	Disagree
5	Strongly Disagree

Perceived Risk and Benefits on the Adoption of Internet Banking		Rating Scale				
a. Perceived risk and benefits		1	2	3	4	5
1	The benefits of Internet banking far outweigh the risks	○	○	○	○	○
2	The risk of fraud using Internet banking is higher	○	○	○	○	○

	than conventional face-to-face banking					
3	The risk of making a mistake with transactions is higher using Internet banking than conventional face-to-face banking	○	○	○	○	○
4	The risk of not being able to get a good quality service using online banking is higher than conventional face-to-face banking	○	○	○	○	○
5	Using Internet banking is more risky than conventional face-to-face banking	○	○	○	○	○
6	Using Internet banking is more risky than telephone banking	○	○	○	○	○
7	Using online banking is convenient	○	○	○	○	○
8	I can save time using online banking	○	○	○	○	○
9	Using online banking enables me to accomplish my banking tasks more quickly than conventional face-to-face banking	○	○	○	○	○

10	I can save money using online banking	○	○	○	○	○
11	I generally tend not to like taking risks in my life	○	○	○	○	○
12	I worry about the Internet because I cannot see what is happening	○	○	○	○	○
13	Internet banking is not secure because no human beings are involved	○	○	○	○	○
14	I use Internet banking because my friends/family use Internet banking	○	○	○	○	○
15	I was the first to use Internet banking among my family/friends	○	○	○	○	○
16	I would recommend using Internet banking to my friends	○	○	○	○	○

Please state the degree with which you agree with the following questions:

17	*I think online banking security can be improved by using biometric technology*	○	○	○	○	○
18	*I believe online banking security needs to be improved*	○	○	○	○	○

Part IV: ***Please state which of the following biometric technologies you would find most appropriate*** *(in terms of comfort and acceptance) for online banking; 1= Ideal 2= very appropriate 3= appropriate 4= not very appropriate 5= not at all appropriate*

	Rating Scale				
Biometric Technology to be considered for authenticating the customer:	1	2	3	4	5
1. Fingerprint recognition reader- automated biometric scanner to authenticate the finger print of the individual	○	○	○	○	○
2. Digital signature- Smart pen which tracks the pressure on paper and angle of the pen.	○	○	○	○	○
3. Hand recognition -A mouse that will use infrared light to scan the structure inside the hand: blood vessels, veins, fatty tissue tendons and any deep scars.	○	○	○	○	○
4. Iris recognition technology - can work at a distance of 20 inches and scans your eye.	○	○	○	○	○
5. Face recognition - Analyses the spacing between facial features and scans your face.	○	○	○	○	○
6. Voice recognition- technology which recognises the voice of the individual when speaking.	○	○	○	○	○
7. Retina scanner - Recognises the retina and scans your eye.	○	○	○	○	○

Part VI. Please indicate the extent to which you agree or disagree with each statement by checking (/ or✓) the number that corresponds to your answer. There are no right or wrong answers - just give us your honest opinion. Use the following scale below:

Cultural Dimensions	1	2	3	4	5
CD1. People in higher positions should make most decisions without consulting people in lower positions					
CD2. People in higher positions should not ask the opinions of people in lower positions too frequently.					
CD3. People in higher positions should avoid social interaction with people in lower positions.					
CD4. People in lower positions should not disagree with decisions by people in higher positions.					
CD5. People in higher positions					

should not delegate important tasks to people in lower positions					
CD6. It is important to have instructions spelled out in detail so that I always know what I'm expected to do.					
CD7. It is important to closely follow instructions and procedures.					
CD8. Rules and regulations are important because they inform me of what is expected of me.					
CD9. Standardized work procedures are helpful.					
CD10. Instructions for operations are important.					
CD11. Individuals should sacrifice self-interest for the group (either at school or the work place).					
CD12. Individuals should stick with the group even through difficulties.					
CD13. Group welfare is more important than individual rewards.					
CD14. Group success is more					

important than individual success.					
CD15. Individuals should only pursue their goals after considering the welfare of the group.					
CD16. Group loyalty should be encouraged even if individual goals suffer.					
CD17. It is more important for men to have a professional career than it is for women.					
CD18. Men usually solve problems with logical analysis; women usually solve problems with intuition					
CD19. Solving difficult problems usually requires an active, forcible approach, which is typical of men.					
CD20. There are some jobs that a man can always do better than a woman.					

Note: PO = Power distance, UN = Uncertainty avoidance, CO = Collectivism, MA = Masculinity, and LT = Long-term orientation

If you are interested in the research results, please write your e-mail address below:

E-mail: .....

Thank you for your participation.

Yusuf Janahi

Email: yjanahi@bradford.ac.uk

Appendix B

Table 5.28 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.649
Bartlett's Test of Sphericity	Approx. Chi-Square	3457.776
	Df	2850
	Sig.	.000

Table 5.29 Communalities

	Initial	Extraction
PPP1	1.000	.684
PPP2	1.000	.697
PPP3	1.000	.639
PPP4	1.000	.643
PPP5	1.000	.696
PPP6	1.000	.788
PPP7	1.000	.736
PPP8	1.000	.709
PPP9	1.000	.663

PSP1	1.000	.642
PSP2	1.000	.690
PSP3	1.000	.658
PSP4	1.000	.655
PSP5	1.000	.625
PSP6	1.000	.644
PSP7	1.000	.714
PSP8	1.000	.670
PSP9	1.000	.671
PSP10	1.000	.712
PT1	1.000	.575
PT2	1.000	.639
PT3	1.000	.706
PT4	1.000	.684
PT5	1.000	.597
PT6	1.000	.659
PIQ1	1.000	.645
PIQ2	1.000	.671
PIQ3	1.000	.640
PIQ4	1.000	.609
PIQ5	1.000	.617
PIQ6	1.000	.717
PRB1	1.000	.687

PRB2	1.000	.695
PRB3	1.000	.693
PRB4	1.000	.688
PRB5	1.000	.704
PRB6	1.000	.632
PRB7	1.000	.759
PRB8	1.000	.646
PRB9	1.000	.731
PRB10	1.000	.730
PRB11	1.000	.650
PRB12	1.000	.688
PRB13	1.000	.617
PRB14	1.000	.721
PRB15	1.000	.769
PRB16	1.000	.660
PRB17	1.000	.684
PRB18	1.000	.673
CD1	1.000	.698
CD2	1.000	.670
CD3	1.000	.735
CD4	1.000	.641
CD5	1.000	.677
CD6	1.000	.665

CD7	1.000	.691
CD8	1.000	.731
CD9	1.000	.745
CD10	1.000	.764
CD11	1.000	.673
CD12	1.000	.697
CD13	1.000	.628
CD14	1.000	.726
CD15	1.000	.732
CD16	1.000	.714
CD17	1.000	.739
CD18	1.000	.671
CD19	1.000	.717
CD20	1.000	.747
BT1	1.000	.709
BT2	1.000	.685
BT3	1.000	.735
BT4	1.000	.742
BT5	1.000	.723
BT6	1.000	.672
BT7	1.000	.689

Extraction Method: Principal Component Analysis.

Table 5.30 Component Matrix[a]

	Component		
	1	2	3
BT1	-.582	.062	-.120
PRB15	.553	-.123	.257
CD20	.462	.428	-.105
PRB11	.412	-.239	-.242
PRB13	-.353	-.057	-.102
BT6	-.328	.051	.282
PPP7	-.326	-.083	.079
PIQ5	.311	-.229	-.086
PRB10	.296	-.213	-.099
PSP10	.292	-.120	.036
PRB8	.290	.124	-.054
PT4	.284	-.028	-.195

PRB6	.274	.245	.142
CD17	.273	.140	-.155
PRB16	-.257	-.064	.257
CD13	-.248	.216	.017
PRB7	.243	.004	.078
CD10	.220	-.118	.148
PSP6	.218	.125	-.063
PSP3	.213	.060	-.128
BT7	.209	-.134	-.173
CD16	.200	.034	.134
BT2	.161	.013	.122
PRB5	.159	-.033	.002
PT3	.119	-.030	-.038
CD7	.114	-.017	.015
CD11	.103	-.030	.079
PT2	.072	-.059	-.001
PPP5	-.039	.008	-.019
CD4	.077	.528	.051
BT3	.001	-.474	.224
CD9	.303	.399	-.105
CD2	.094	-.386	-.309
PT1	-.225	.364	.143
PRB9	.033	.357	.113

PRB4	-.099	.325	-.115
PT5	-.194	.320	-.087
PIQ3	.165	-.310	.035
PRB18	-.268	-.288	-.176
CD18	.244	.258	.112
CD19	.119	-.247	.144
PPP6	-.062	.235	-.022
PSP4	-.108	.226	-.112
PRB1	-.022	.224	-.068
PPP4	.092	-.220	.192
PRB12	-.114	.211	-.093
CD5	.166	.211	-.168
PRB17	-.012	-.183	.063
PSP5	.052	.165	.043
PPP1	-.069	.097	-.005
PSP1	-.002	-.070	-.012
PRB2	-.044	.045	-.006
CD14	-.179	-.164	-.560
CD12	-.088	-.093	.368
PIQ1	-.037	.005	.345
PSP9	.084	.110	.337
PPP2	-.111	-.159	.329
PIQ6	.090	-.016	.310

PPP9	-.019	-.046	.247
PSP8	-.087	-.208	-.227
PT6	.077	-.160	.209
BT5	-.178	-.091	-.208
CD8	-.168	-.076	.208
PRB3	.065	.053	-.206
CD1	.070	-.149	.206
PPP3	-.158	-.136	-.196
PPP8	.037	.118	-.192
CD3	-.096	.113	.187
BT4	-.036	.150	.184
PRB14	-.014	-.168	-.173
PSP2	-.128	.018	-.170
PIQ4	.069	.050	-.167
CD15	-.009	.010	-.154
PSP7	-.041	.002	.097
PIQ2	-.080	.030	-.097
CD6	.047	-.045	-.052

Extraction Method: Principal

Component Analysis.

a. 3 components extracted.

Table 5.31 Rotated Component Matrix[a]

	Component		
	1	2	3
PRB15	.603	.064	.033
CD14	-.686	.028	.267
BT1	-.780	-.110	-.174
CD20	.670	-.202	.182
PRB18	-.609	.134	-.025
PRB6	.779	-.095	.051
CD18	.646	-.122	.063
PRB13	-.744	-.105	-.095
CD9	.737	-.242	.200
PSP9	.779	-.037	-.231
BT5	-.678	-.009	.077

PPP3	-.774	.041	.069
PSP8	-.665	.133	.120
PRB8	.643	.005	.208
PPP7	-.642	-.055	-.240
CD16	.534	.064	-.011
PRB7	.527	.104	.053
BT2	.590	.066	-.023
PSP6	.584	-.027	.180
PSP2	-.577	-.084	.085
PRB14	-.566	.132	.116
PSP5	.527	-.124	.013
PRB5	.509	.097	.072
CD11	.507	.077	-.022
PIQ2	-.098	-.069	.048
CD7	.088	.064	.041
PPP5	-.037	-.025	-.002
BT3	-.075	.747	-.263
CD4	.296	-.741	.074
PT1	.047	-.712	-.178
PT5	-.064	-.678	.028
CD2	-.239	.664	.252
PIQ3	.020	.653	.004
PRB4	-.004	-.644	.099
PIQ5	.103	.631	.192
PRB10	.090	.609	.198
PRB9	.225	-.600	-.026
CD13	-.094	-.698	-.103
CD19	.065	.685	-.102
PSP4	-.049	-.658	.077
PPP4	.080	.653	-.153
PRB12	-.050	-.647	.056

PPP6	.035	-.640	.025
PSP10	.193	.633	.095
PRB1	.038	-.617	.082
CD10	.196	.611	-.036
PT6	.101	.594	-.166
CD1	.099	.581	-.165
PRB17	-.050	.565	-.088
PPP1	-.016	-.517	-.015
PT2	.031	.083	.028
PSP1	-.036	.062	-.001
PRB2	-.019	-.059	-.009
BT6	-.086	-.161	-.795
PRB11	.096	.269	.774
CD12	.083	.077	-.773
PPP2	.019	.124	-.761
PRB16	-.091	-.029	-.757
PIQ1	.149	.007	-.713
PT4	.106	.129	.703
CD17	.186	-.025	.688
CD8	-.053	.015	-.673
CD5	.125	-.135	.657
BT7	.018	.195	.631
PPP9	.092	.053	-.628
PIQ6	.221	.077	-.624
PSP3	.121	.024	.624
PRB3	-.034	-.037	.617
PPP8	-.023	-.107	.600
CD3	.067	-.128	-.591
PIQ4	-.012	-.030	.585
BT4	.126	-.136	-.552
CD15	-.081	-.025	.529

PSP7	.019	-.011	-.503
PT3	.060	.074	.086
CD6	-.009	.056	.061

Table 5.32 Regression Weights: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
PPP1 <--- X1	1.000				
PPP2 <--- X1	.664	.32	9.275	***	par_1
PPP3 <--- X1	.711	.048	11.234	***	par_2
PPP4 <--- X1	-.040	.146	-12.272	***	par_3
PPP5 <--- X1	.001	.021	7.050	.***	par_4
PPP6 <--- X1	.706	.029	10.191	***	par_5
PPP7 <--- X1	-.574	.033	-11.122	***	par_6
PPP8 <--- X1	-.609	.035	-12.253	***	par_7
PPP9 <--- X1	-.040	.149	-9.271	***	par_8
PSP1 <--- X2	1.000				
PSP2 <--- X2	.915	.059	7.673	***	par_9
PSP3 <--- X2	.425	.061	14.312	***	par_10
PSP4 <--- X2	.758	.137	13.315	***	par_11
PSP5 <--- X2	-.731	.090	-13.886	***	par_12
PSP6 <--- X2	-.828	.100	-15.347	***	par_13
PSP7 <--- X2	-.924	.059	-13.493	***	par_14
PSP8 <--- X2	-.794	.045	-10.220	***	par_15

			Estimate	S.E.	C.R.	P	Label
PSP9	<---	X2	-.139	.031	-2.091	***	par_16
PSP10	<---	X2	-.548	.013	-5.377	***	par_17
PT1	<---	X3	1.000				
PT2	<---	X3	-.799	.029	-6.868	***	par_18
PT3	<---	X3	-.604	.015	-4.482	***	par_19
PT4	<---	X3	-.671	.003	-2.217	***	par_20
PT5	<---	X3	.809	.045	2.341	***	par_21
PT6	<---	X3	-.596	.052	-1.968	***	par_22
BT7	<---	X6	1.000				
BT6	<---	X6	-.674	.099	-2.844	***	par_23
BT5	<---	X6	-.781	.175	-6.295	***	par_24
BT4	<---	X6	-.571	.165	-8.746	***	par_25
BT3	<---	X6	.653	.030	2.503	***	par_26
BT2	<---	X6	.998	.030	4.184	***	par_27
BT1	<---	X6	-.538	.043	-3.450	***	par_28
CD15	<---	X7	1.000				
CD14	<---	X7	-.998	.193	-12.541	***	par_29
CD13	<---	X7	-.890	.198	-4.387	***	par_30
CD12	<---	X7	-.877	.176	-6.444	***	par_31
CD11	<---	X7	.461	.079	12.526	***	par_32
CD10	<---	X7	-.393	.065	-6.569	***	par_33

			Estimate	S.E.	C.R.	P	Label
CD9	<---	X7	.843	.028	3.581	***	par_34
CD8	<---	X7	-.853	.447	-3.538	***	par_35
CD7	<---	X7	-.167	.960	-14.085	***	par_36
CD6	<---	X7	.724	.984	12.063	***	par_37
CD5	<---	X7	.825	.648	6.536	***	par_38
CD4	<---	X7	.237	.802	12.577	***	par_39
CD3	<---	X7	.688	.287	4.213	***	par_40
CD2	<---	X7	-.757	.106	-4.570	***	par_41
CD1	<---	X7	-.014	.501	-8.548	***	par_42
CD16	<---	X7	-.206	.117	-12.184	***	par_43
CD17	<---	X7	.537	.914	6.459	***	par_44
CD18	<---	X7	.671	.354	7.568	***	par_45
CD19	<---	X7	-.141	.976	-12.450	***	par_46
CD20	<---	X7	.896	.451	13.582	***	par_47
PRB15	<---	X5	1.000				
PRB14	<---	X5	.020	.106	11.185	***	par_48
PRB13	<---	X5	-.647	.115	-2.143	***	par_49
PRB12	<---	X5	-.689	.150	-2.918	***	par_50
PRB11	<---	X5	.759	.117	3.057	***	par_51
PRB10	<---	X5	.647	.123	2.000	***	par_52
PRB9	<---	X5	.522	.087	2.542	.001	par_53

	Estimate	S.E.	C.R.	P	Label
PRB8 <--- X5	.534	.112	4.780	***	par_54
PRB7 <--- X5	.633	.143	2.320	.020	par_55
PRB6 <--- X5	.179	.103	2.730	***	par_56
PRB5 <--- X5	.540	.137	3.757	***	par_57
PRB4 <--- X5	-.099	.070	-5.419	***	par_58
PRB3 <--- X5	-.024	.086	-7.283	***	par_59
PRB2 <--- X5	.614	.101	8.142	***	par_60
PRB1 <--- X5	-.566	.142	-9.167	***	par_61
PRB16 <--- X5	-.618	.124	-6.759	.003	par_62
PRB17 <--- X5	-.227	.105	-2.172	.010	par_63
PRB18 <--- X5	-.158	.096	-10.647	.009	par_64
PIQ6 <--- X4	1.000				
PIQ5 <--- X4	.673	.675	3.427	.003	par_65
PIQ4 <--- X4	.158	.118	2.141	***	par_66
PIQ3 <--- X4	.985	.263	2.319	***	par_67
PIQ2 <--- X4	-.939	.835	-5.057	***	par_68
PIQ1 <--- X4	.529	.291	2.178	***	par_69

Table 5.35 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.734	.587	.754	.910	.974
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table 5.36 Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
PIQ1	.929
PIQ2	.722
PIQ3	.766
PIQ4	.877
PIQ5	.945
PIQ6	.817
PRB18	.646
PRB17	.661
PRB16	.885
PRB1	.883

	Estimate
PRB2	.631
PRB3	.674
PRB4	.929
PRB5	.960
PRB6	.877
PRB7	.878
PRB8	.954
PRB9	.823
PRB10	.935
PRB11	.841
PRB12	.953
PRB13	.682
PRB14	.857
PRB15	.853
CD20	.878
CD19	.884
CD18	.891
CD17	.941
CD16	.941
CD1	.960
CD2	.969

	Estimate
CD3	.889
CD4	.971
CD5	.909
CD6	.970
CD7	.931
CD8	.971
CD9	.914
CD10	.963
CD11	.973
CD12	.956
CD13	.963
CD14	.674
CD15	.954
BT1	.814
BT2	.737
BT3	.595
BT4	.863
BT5	.950
BT6	.964
BT7	.955
PT6	.947

	Estimate
PT5	.670
PT4	.675
PT3	.878
PT2	.970
PT1	.959
PSP10	.741
PSP9	.812
PSP8	.946
PSP7	.870
PSP6	.853
PSP5	.734
PSP4	.730
PSP3	.680
PSP2	.824
PSP1	.750
PPP9	.978
PPP8	.961
PPP7	.678
PPP6	.689
PPP5	.955
PPP4	.752

	Estimate
PPP3	.809
PPP2	.976
PPP1	.935